Commonwealth Bureau of Census and Statistics,
MELBOURNE.

OFFICIAL STATISTICS,
COMMONWEALTH OF AUSTRALIA.

The Private Wealth of Australia and Its Growth

AS ASCERTAINED BY VARIOUS METHODS,

TOGETHER WITH

A Report of the War Census of 1915.

PREPARED UNDER INSTRUCTIONS FROM THE MINISTER OF STATE FOR HOME AND TERRITORIES,

BY

G. H. KNIBBS, C.M.G.,

Fellow of the Royal Statistical Society, Membre de l'Institut International de Statistique, Honorary Member American Statistical Association, and of the Société de Statistique de Paris, &c., &c.

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PREFACE.

As indicated by the title, the matter contained herein relates mainly to the private wealth of Australia, and an examination of the various methods adopted here and elsewhere for the purpose of estimating the wealth of a community. It includes also a brief report of the results of the War Census in respect of (*a*) males of military age, (*b*) net private income of the people, (*c*) net private assets of the people. Many of these latter have already appeared from time to time in the publications of the Bureau.

The three principal methods of estimating the wealth of a community, viz., (i.) by means of a wealth-census, (ii.) by the use of probate-returns, (iii.) by the inventory-method based on miscellaneous statistical and other records, are considered in some detail, and the advantages and disadvantages of each are discussed.

An estimate of the private wealth of Australia based on probate returns was made in 1911 by Mr. A. M. Laughton, F.I.A., F.F.A., the Government Statist of Victoria, who obtained a total of £990,000,000, which he subsequently increased to £1,031,000,000. Reasons are given herein for the opinion that owing to defects inherent in the probate-return methods, this estimate is below the truth, and this opinion is supported by the War Census records, which, although clearly incomplete, gave for the private wealth of Australia in 1915 a total of £1,643,000,000. A further evidence of the defect in the method based upon probate-returns is an estimate for 1915 contained herein based upon the inventory-method. This estimate gave a total for Australia of £1,620,000,000. For the sake of comparison an allowance should be made for items which are excluded from private wealth in the inventory-method, but are included therein at a wealth-census and in probate-returns. These are such assets as the locally held securities in respect of public and municipal debt. With this allowance the comparable inventory total becomes about £1,760,000,000 as at the 30th June, 1915, or

say £355 per head of population. This total is an estimate of all the private material wealth existing in Australia at 30th June, 1915, whether owned by Australian residents or not, with the addition of a sum of £140,000,000 estimated as the value of locally held securities in respect of loans to Australian Governments and local governing bodies. The portion of the Australian total belonging to persons not resident in Australia is difficult to estimate but is probably in the neighbourhood of £175,000,000.

As a result of the careful review of the several estimates, the conclusion arrived at is that the most satisfactory wealth estimates will be obtained by means of a combination of the wealth census and inventory methods.

G. H. KNIBBS,
Commonwealth Statistician.

Commonwealth Bureau of Census and Statistics,
Melbourne, 25th February, 1918.

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THE PRIVATE WEALTH OF AUSTRALIA AND ITS GROWTH

AS ASCERTAINED FROM THE WAR CENSUS OF 1915 AND FROM PROBATE RETURNS,

TOGETHER WITH

A REPORT ON THE WAR CENSUS OF 1915.

PART I.—THE NATURE OF NATIONAL WEALTH.

CHAPTER I.—INTRODUCTION.

1. **General.**—The aggregate *Private Wealth* of any homogeneous community constituting a nation, together with its corporate possessions, may be called its *National Wealth.* A clear understanding of the essential character of such wealth is important, since confusion of thought is common in regard thereto. For this reason it is necessary to pay attention both to the nature of its component elements and the means of estimating their value, as well as to the uncertainties and limitations of such estimates.

In regard to ownership, the wealth of any country may mean several things, viz., either (i.) the wealth owned by the people domiciled therein (*a*) the corpus itself being within the country, or (*b*) without that restriction; or (ii.) the wealth within the country irrespective of the domicile of the owner. Owing to what has been called the "anonymity" of capital, wealth may—to a considerable extent—be owned by persons not only not domiciled in a country, but even by those who owe it no allegiance.

In respect of value an estimate of national wealth may be founded upon more or less shrewd guesses at the average wealth per unit of population; upon rough computations based upon statistics of banking deposits, together with houses and land occupied; and similar data. Such guesses, however, have no authority, since their degree of accurracy cannot be ascertained. A census of the wealth of a group in any community, either taken at random, or better, properly selected, gives a result of greater weight. Estimates may also be founded upon returns of income—a method which, however, is very precarious; upon the value of estates of deceased persons, considered as representative of the rest of the community. This latter method would appear to have claim to considerable confidence. With proper precautions, doubtless any or all of these methods may well be employed.

Estimations based on the values of the estates of persons dying have been supposed by many to be of peculiar value, inasmuch as the responsible evaluation of estates for the purposes of probate presumably furnishes results of more than ordinary accuracy. In fact, the estates of deceased persons are assumed to be, as it were, a most appropriate parcel, viz., one taken quite at random, and sufficiently large to be representative. The method of estimating the total wealth from probate returns will consequently be exhaustively considered. The best result is, of course, furnished by a complete census of wealth, provided that the valuations are carefully made upon a common basis.

2. **Value, how estimated: its uncertainty.**—The term "Wealth" has, of course, no unique meaning, nor is the value of anything which may be classed as wealth always susceptible of exact expression in terms of money. This applies more particularly to the corporate possessions of a people. Though the values in which estimates of wealth are expressed must necessarily be *exchange-values*, these are by no means fixed and unalterable, nor are they, though necessarily the common basis of all comparisons, readily ascertained with a high degree of accuracy.

Wealth—in the sense which we are considering—is ordinarily represented by tangible securities, *e.g.*, currency, consols, inscribed stocks, bonds, shares, real-estate, etc. The values of these, however, often rapidly fluctuate with public credit or popular appreciation. For this reason estimates of value need to be made—as far as possible—in normal times, and changes of value do not necessarily represent actual changes in the physical element constituting the wealth. When the purpose is to ascertain the material basis of wealth the method will of course differ (*e.g.*, the *numbers*, rather than the *values* of flocks and herds would then be important).

3. **Importance of clear statements as to methods of estimation.**—It has already been said that mere *guesses* are without real value, at least for comparative purposes, and it is evident from what has preceded, that the proper *estimation* of the total wealth of any community is not a simple matter. Some so-called estimates are little better than examples of "statistical charlatanism."

Statistical estimates, in order to possess authority, must be well founded, and consequently the basis upon which they rest must be declared. When they are given on personal authority only, their value cannot be ascertained. For this reason statisticians and other publicists recognise that mere personal opinion, or a mere statistical *ipse dixit*, must not be allowed weight, not only because it lends itself to statistical imposition, but also because the reliableness of the results put forward cannot be indicated.

In his "Sozialstatistik" (Leipzig, 1908), G. Schnapper-Arndt says:—concerning certain tables purporting to give the national wealth of a number of civilised countries—that the greater part of the particulars have been merely fabricated.[1] Very little consideration will shew the force of this remark. For, quite apart from the basic difficulty of accurately estimating in terms of money various forms of wealth, very few people can say off-hand, with any exactitude, the value of what they possess. Moreover, values themselves have a wide range, viz., from those disclosed under conditions of "forced sale" to those when sales are under the most favourable conditions for the seller. Hence even when a comprehensive census of wealth is undertaken, and all persons are required to furnish, under appropriate categories, the value of all material wealth possessed by them, with every safeguard to avoid repeated inclusion of the same items (as when encumbrances exist) the result is subject to a larger margin of uncertainty than is commonly appreciated. A comparison of estimates of value made at "boom" times with those made at ordinary times is but an extreme case of this uncertainty. It is evident, from these and similar considerations, that comparisons of wealth estimated as existing at different dates are subject to a large measure of uncertainty, quite apart from that arising from the varying significance of the money standard, and deductions based on such estimates, expressed in terms of pounds sterling, have to be used with corresponding caution.

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[1] His exact statement is:—"der grösste Teil dieser Daten ist nun gänzlich aus der Luft gegriffen"; vide op. cit., p. 259.

A careful consideration of the whole matter will disclose that among estimates of wealth with any pretensions to accuracy there are two, at least, which take a high place, viz. :—

(1) Estimates furnished in a Census of Wealth (usually made by its possessors);

(2) Estimates of wealth disclosed through death (probate returns).

The first is usually fairly complete, and is of a precision governed by the integrity of the returns themselves. Where the returns do not systematically either understate or overstate, the final result may be regarded as of high precision.

Although, as above stated, the second method is obviously of the nature of a representative parcel, it is only a partial return, since probate returns are not required for estates of small value, and therefore the total wealth will be understated if no allowance be made for this fact. Moreover, for short periods the returns themselves are subject to a considerable measure of uncertainty as " representative parcels," inasmuch as large estates come under review only with great irregularity. It will be necessary to consider these limitations.

4. **Sense in which wealth is attributable to individuals.**—A person living in any community may possess wealth consisting of lands, goods, or instruments of credit, (*a*) *within* the territory occupied by that community, or (*b*) *without* it. In the former case there can be no doubt that such wealth is part of the communal or national wealth : in the latter case, the *purpose* of the estimate would determine whether the inclusion or exclusion of particular items was necessary. For ordinary purposes (*b*) would be included in estimates of national wealth, inasmuch as such wealth has *exchange-value, notwithstanding that the corpus itself is not in the territory occupied by the community.* There may, however, in some cases be a measure of uncertainty as to the total wealth to be accredited to a country, owing to uncertainties of nationality and domicile. For example :—Let us suppose that A, an individual living in the community considered, has property therein of value W, subject to an encumbrance of w, held over it by F, the latter being abroad. The value to be recorded is $W-w$; and, if questions of domicile were always definite, and a census of wealth was complete, there could be no uncertainty in respect of the estimation of the communal wealth. If, however, F were only temporarily abroad, and his real domicile were in the community, the total wealth ought to be W, the part $W-w$ belonging to A, and the part w belong to F.[1]

5. **Wealth under private ownership.**—The term *private wealth* is used in contradistinction to *public* or *semi-public wealth.* In Australia the term would cover all that wealth, the proprietorship of which resides in individuals in their *private*

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[1] The importance of questions of nationality and domicile have come into prominence through recent events. Dual nationality, and the system by means of which all the responsibilities of nationality can be avoided, and all its benefits secured, are reflected in questions of ownership. The establishment also of local companies almost wholly with foreign capital, the proportion of local capital being merely nominal, may reduce the net value of large properties to a negligible quantity. Under the present system foreigners can establish themselves in a territory (for example where an attack on which is contemplated by their Governments), and thus, though the corpus of the wealth may be *in* the country, its legal possession and enjoyment may be foreign. This shews not only that the difference between what may be called the geographical location of wealth and the domicile of its ownership is of the first degree of importance, but also that the wealth of a territory may be advantageous or disadvantageous, according as its usufruct and potentialities are nationally enjoyed by the country in question, or by a foreign people. See " Gli insegnamenti della guerra circa il trattamento degli stranieri, " by Prof. P. Fedozzi, " Scientia, I., xii., 1915, pp. 402-418," and " Nationality and Naturalisation," by Dr. E. J. Schuster, Contemporary Review, Jan. 1917, pp. 93-99.

capacity, and is not vested either in the Federal Government, a State Government, or any form of Local Government. It thus comprises all wealth

(i.) which is under the direct control of the individual proprietors thereof.

(ii.) which is administered in trust or by delegation in the interest of individual proprietors.

(iii.) which by the intermediary of shares, debentures, stock, mortgages, or other means is allocated directly or indirectly, wholly or in part to individual proprietors.

(iv.) which is collectively owned by groups of private persons without any specific allocation to individual proprietors.

Section (iv.) comprises such forms of wealth as the property of Clubs, Churches, Schools of Art, Mechanics Institutes, etc. These may for certain purposes be conveniently classed as *social private wealth.*

6. **Wealth under communal ownership.**—In all well-developed modern communities a considerable quantity of wealth is vested in local governing bodies of various types, whose scope and functions are usually prescribed by legislation or by regulations of the central government. These bodies include city, municipal, borough, shire and similar councils; irrigation-trusts; tramway-trusts; school-boards; hospital-boards; fire-brigades; waterworks-boards; harbour-trusts; etc., etc. The property held by them covers a wide field, and includes such items as roads, railways, tramways, public buildings, plant, machinery, reservoirs, water channels, etc., etc. The several bodies controlling these forms of wealth are required to administer them in a *public* capacity for the benefit of the community resident within the ambit of the jurisdiction of the body in question. The property is in a sense owned by the persons who make up that community, but it is owned by them collectively not individually, and the constitution of the corporate controlling body is usually not amenable to direct alteration by the members of the community in question.

7. **Wealth under national ownership.**—All those forms of wealth the proprietorship of which vests in the central governing body may be conveniently classed as being under *national ownership.* In the case of Australia and other federations, this is somewhat complicated by the fact that there is usually not one but two such bodies (which divide the central control between them), viz., the Federal Government, and, in respect of any given part, a State Government. It will be convenient, however, to class the property of Federal and State Governments under the one general heading of *national ownership.* In Australia the principal items of property which are the subject of *national* ownership are Crown Lands, Government Railways and Tramways; Government Buildings; Naval and Merchant Fleets; Waterworks; Harbour Works; Telegraphs and Telephones; Defence Works; and Naval and Military equipment and material.

8. **Variation in valuation cases.**—From the foregoing classification of ownership under the three heads of *private, communal, and national,* it will readily be understood that it is quite impossible to obtain any estimate of the value of *all property* on the basis of exchange value, since many properties, while rendering great services to the community, would possess little value in exchange, owing to the absence of any market for the property in question. This is especially the case with many of the

items of *communal and national* ownership. For example, a building erected and equipped as a Parliament House or as a Public Library would be of little value, in proportion to its cost, for any other purpose, and thus being practically unsaleable, cannot be properly said to have any value in exchange. In other cases, as for example Government Railways, there is no doubt that if offered for sale they would realise high prices, but in the absence of any sales of this nature it is impossible for any one to say what their exchange value might be, and how it would compare with their cost of construction. Another class of property under *national ownership*, viz. Crown Lands, occupies a somewhat different position from either of the foregoing. In closely settled districts there is practically always a market for real estate, and within reasonable limits a fair exchange value could always be ascertained in respect of the Crown Lands in such districts. In sparsely settled pastoral districts on the other hand, where the land is usually occupied under some form of lease from the Crown, this does not apply, and it is even less applicable in the case of the huge tracts of *unoccupied lands* which make up so large a proportion of the Crown Lands of Australia. Much of both of these latter classes will probably have considerable exchange-value in the future, and possibly in the near future, but at present there is no basis on which anything deserving the name of an *estimate* of their value could be made.

In the case of private wealth on the other hand there is not the same difficulty, and in most cases reasonably accurate estimates of the exchange value can readily be made. Thus we see that although both private and national wealth may be productive in varying degrees, or may even involve varying degrees of loss, and that these facts may materially affect the exchange value of the wealth, they are in themselves irrelevant. The exchange-value is the only relevant matter in estimations of private wealth, other questions may therefore be dismissed from consideration, notwithstanding that for *particular* purposes other bases of estimation may be necessary, for example the value of railway and other public services as already indicated.

9. **The fluctuation of wealth.**—It is important, however, to bear in mind that wealth is not a fixed, it is always a fluctuating, quantity. In a country like Australia —a large and compact island continent—in which a considerable portion of the wealth consists of flocks and herds, the fluctuations are quite considerable, not merely because the physical elements of the wealth vary considerably with abundance or dearth of rainfall, but also because their exchange-values are materially affected by the same causes. Drought conditions, for example, may not only cause substantial losses in actual numbers, but also, because of the long distances to markets, may prejudice their exchange-values.

It is obvious, from considerations analogous to the above, that *estimates of wealth* to be of the highest value and to serve for comparative purposes, must *be based upon average conditions.* It follows, therefore, that a census of wealth which merely gives values at a particular moment will, ordinarily, but imperfectly represent such average conditions. On the other hand, however, it rarely happens in extensive territories, that physical conditions are specially adverse or specially favourable throughout the entire area at any given time: consequently, as the territory embraced in any estimate is increased in size, the result of any estimate tends more and more to express average conditions.

The *range* of fluctuation for different classes of wealth is by no means identical. In the case of sheep and cattle in Australia, for example, the variations of exchange-value are very large, while those for houses and buildings, plant and machinery, etc.,

are, relatively thereto, only small. In so-called "boom times," values ascribed to land are unusually high; at the collapse of a "boom" they are very low: national securities fluctuate greatly with national credit, with the probability of war, or of the fortunes of war, etc.; estimates for probate or other duties are usually too low, while estimates, made without regard to the liability to duty, are likely to be too high.

In order that a Census of Wealth should furnish a normal result, therefore, it is requisite that the period covered should be sufficient to furnish average values. The period over which the values are taken should consequently be commensurate with the fluctuation periods, which, as said, are diverse for different classes of wealth. A census of wealth representing values at a particular moment may be consequently very unsatisfactory if the selected moment should happen to be one at which other than average conditions obtain; and this fact has to be kept in view.

CHAPTER II.—VARIOUS MODES OF ESTIMATING WEALTH.

1. **A census of wealth.**—A comprehensive census of wealth furnishes a direct estimate of such part of the possessions of a community as can be expressed in terms of money values. Such a census indicates the wealth as referred to a particular moment of time, and its worth depends upon the care with which the estimates of exchange value are made.

The nature of the War Census, and of its merits and limitations are dealt with in Parts II., III., and IV.

2. **Probate returns.**—In practically all civilised countries there are what are generally known as "succession" duties, based upon the value of the estates which pass to successors in title. Owing to this a valuation has perforce to be made on the death of possessors. Such valuations are available in Australia in the "probate returns," and afford a means of gauging the wealth of the entire community, forasmuch as the returns shew the wealth possessed by a part of the community which can be regarded—as pointed out—as a "fair sample."

The methods which have been adopted for ascertaining the ratio between what passes to successors in a unit of time (one year) and the total wealth of the community, are two, viz., (i.) the determination of the average interval of time between the passing of estates to the successors in title, and (ii.) the ascertainment of the average rate of the passing of estates during any period under review. The first may appropriately be called the *devolution-interval method*, and the second the *devolution-rate method*. Obviously the two methods are—in the last analysis—essentially the same, the number of years in the devolution interval being the reciprocal of the annual rate of devolution. At first sight it might therefore appear that it is a matter of little moment which method we follow. This surmise is, however, not correct, for reasons which are given hereinafter, and which, briefly expressed, are that the devolution-interval method is the more complicated and uncertain, and that the corrections—which must be applied to any crude estimate of its value—are not readily computed or easily ascertained.

3. **The devolution interval.**—Since the average length of life differs in the case of males and females, the devolution interval varies according to sex: moreover, as the rate of mortality is diminishing for both sexes the interval is lengthening for both. For this reason, if it be treated as a constant quantity, deduced estimations of the

aggregate of wealth, based upon any value founded on past experience, are consequently unsatisfactory unless they are corrected for the increased "expectation of life." The interval is, of course, the weighted average period between the succession to wealth in one generation and its passing on to the next. The determination of the "weights" to be used in ascertaining the weighted average introduces complexity into the method.

There is a fundamental defect in the devolution-interval method, which it is important to consider. It is this:—All wealth created during the life-time of any individual obviously operates virtually as a reduction of the period intervening between "successions." Thus this period, when exactly ascertained, should be altered by way of correction. The data, however, furnish no information by means of which the necessary correction can be evaluated.

Wealth that is conveyed during the lifetime of possessors causes estimates of the total deduced from a correct estimate of the devolution-interval to be understated. The matter is later considered in detail.

4. **The devolution-rate.**—The fundamental conception of the devolution-rate method of estimating the aggregate wealth is that the persons dying during any period constitute a "fair sample" of the living, as regards the possession of wealth. If the wealth of those dying be known, that of those living could be deduced by multiplying by the ratio of the living to the dying. That proportion of the dying, whose estates are sufficiently large to come under review in probate returns, give an aggregate of wealth which is too small, and consequently the wealth of the remainder must be estimated in order to furnish the total wealth of the dying.

This then is the *principle* of the method. In applying it, however, it is necessary to bear in mind that the distribution of wealth varies according to both age and sex, and therefore the death of those dying should be dealt with according to age-groups and for the sexes separately.

If the period of review be short, one year for example, the infrequency of the appearance of large estates in probate returns is such that it will occasion large discrepancies in the result deduced for successive years, according as a large estate appears, or does not appear, in the returns. Consequently accurate results can be expected only if the estimate is extended over a sufficient number of years. We shall see later that this should be at least 10 years in Australia. But since in 10 years values may change considerably, the result applies, not to any moment of time, but represents rather—in any community in which wealth is increasing—a decennial average referable to a moment somewhat later than the mean of the period. We may call this the weighted mean, the weighting factor being the wealth.

This in brief is the principle. But in detail, the matter is not quite so simple. Account must be taken of the passing on of wealth before death, for this, by reducing the wealth appearing in the probate-returns impairs their value as a "fair sample." Moreover, it assumes that the death-rate depends solely upon age. If, however, the condition of life—as regards wealth—is affected, those represented in probate-returns are again not a "fair sample" of all persons of the same sex and age. It is then evident that before the method can be regarded as quite satisfactory these features must be examined and corrections applied if necessary.

5. **Comparison of Methods.**—It will be necessary, later, to compare the estimate of wealth obtained by means of the War Census, with that obtained from probate returns. After a full exposition of the two, a part will be devoted to the discussion of any discrepancy between the results. This is the more necessary as the present instance is believed to be unique in respect of making such a comparison.

PART II.—WAR CENSUS OF 1915—GENERAL.

CHAPTER I.—LEGISLATION AND ORGANISATION.

1. **Legislation.**—The War Census was authorised by the Commonwealth War Census Act 1915, assented to on the 23rd July, 1915. This Act provided that it "shall continue in operation during the continuance of the present war and no longer, and that a census or censuses shall be taken in such States, Territories or parts of the Commonwealth, and on such day or days, or within such period or periods as the Governor-General appoints by proclamation."

In accordance with this provision a proclamation, issued on the 25th August, 1915 (see Commonwealth Gazette, 25. 8. '15, p. 1633), fixed the period for the Census of 1915 as from 6th to 15th September. A further Act, the War Census Act (No. 2) 1915, assented to on 6th September, 1915, required the transmission by post, free of charge, of all papers provided for in the principal Act.

Two schedules to the principal Act furnished tentative forms of inquiry, provision being made in Section 8, of that Act, that modifications and additions might be prescribed. A regulation setting forth these forms of inquiry as amended in accordance with the Act was issued on 10th August, 1915.

2. **Forms of Inquiry.**—As already indicated, the forms of inquiry provided for were two. That contained in the amended First Schedule to the Act, and known as the "*Personal Card,*" was as follows :—

Commonwealth of Australia.

WAR CENSUS (1ST SCHEDULE).

Write Clearly. PERSONAL CARD.

To be filled in by all MALES aged 18 and under 60.

1. Name in Full..... (Underline Surname.)
2. Full usual Postal Address (including State)— .....
   (If away from usual residence when filling in card, the postal address to be given here is that of your usual residence.)
3. Date of Birth :—Day.....Month.....Year.....
   State Age last Birthday.....years.
4. State whether Married (M), Widower (W), or Single (S).....
5. State Number and Relation of Dependent Relatives (if any).....
6. State whether your General Health is Good, Bad, or Indifferent.....
7. If suffering from Blindness, Deafness, or Loss of a Limb, give particulars .....
8. What is your present Occupation ?.....
   8A. State Grade of Occupation.....
   (If employing labour other than domestic, insert E ; if working on own account but not employing labour, insert O ; if assisting but not receiving salary or wages, insert A ; if in receipt of salary or wages, insert W ; if out of work for more than the week prior to 30th June, 1915, insert N.)
   8B. If you are an Employee, what is the Occupation of your Employer ?.....
9. What other Occupation (if any) could you undertake ?.....
10. What Military Training (if any) have you had ?.....
11. State number and description of firearms, and quantity of ammunition you possess.....
12. State Country of Birth of :—
    (i.) Yourself .....
    (ii.) Your Father .....
    (iii.) Your Mother .....
13. If born in a Foreign Country of Foreign Parentage, are you a Naturalized British Subject ?.....
14. If so, when and where was Naturalization effected ?.....

Date..... *Signature*.....

Additional lines for answers were provided where necessary.

This card measured approximately 8¼ by 5¼ inches, and was printed on white cartridge paper, the whole of the inquiries being made on one side of the card.

The card prescribed in the amended Second Schedule to the Act, and known as the "*Wealth and Income Card*," made provision for returns relating to (i.) Income for the year ended 30th June, 1915; (ii.) Assets owned or held in Australia at 30th June, 1915; (iii.) Vehicles; (iv.) Live Stock.

This card, printed on pink cartridge paper, was of the same size as the Personal Card, both sides being used for the purpose of the inquiries, and was as follows :—

(Front of Card.)

Commonwealth of Australia.

WAR CENSUS (2ND SCHEDULE).

Write Clearly. WEALTH AND INCOME CARD.

To be filled in by all persons aged 18 or upwards possessed of property, or holding property on trust, or in receipt of income, and by other persons, companies, corporations, associations corporate or unincorporate, institutions, or other bodies specified in any proclamation under the War Census Act.

1. Name in full of person, &c., to whom this return applies; state if (Mr., Mrs., Master, or Miss) ..... (Underline Surname.) .....

2. Full usual Postal Address (including State) of person to whom the return applies*.....
   * If away from usual residence when filling in card, the postal address to be given here is that of your usual residence. (Use N.S.W., Vic., Qu., S.A., W.A., Tas., N.T., or F.T. for name of State.)

3. If you own Motor Cars, Motor Cycles, other Motor Vehicles, or Traction-engines, state how many and the horse-power of each, and for what purpose used; also the kind and number of any other Vehicles owned by you.....

4. **Income.**—What was the amount of Income received by you during the twelve months ended 30th June, 1915, from sources mentioned below :—

(If this Return relates to your own income fill in column (A) but not column (B). If it relates to a trustee-income, or income of a company, &c., fill in column (B) but not column (A).)	(A)—On Own Account.	(B)—On Account of Other Persons, Companies, &c.
	£	£
(i.) Stipend, Salary, or Wages		
(ii.) Profession, Trade, Business, or Industry carried on by you ..		
(iii.) Fees and Commissions		
(iv.) Superannuation, Pension (not being Commonwealth Old-age or Invalid Pension) and Annual Retiring Allowance.†		
(v.) Quarters, Board, &c., allowed by Employer		
(vi.) Rent		
(vii.) Interest and Dividends		
(viii.) Annuities, Royalties, Tributes, Licences, &c.		
(ix.) Income as Beneficiary from Trust Estate		
(x.) All other sources		
(ix.) Add 5 per cent. on Capital Value of your own land and Improvements used by yourself for purpose of residence or enjoyment		
TOTAL .. £		
Less—		
(i.) Amount actually paid by you for Fidelity Guarantee on yourself		
(ii.) Interest actually paid on Borrowed Money		
(iii.) Repairs and Maintenance of Property actually paid for ..		
(iv.) Life, Fire, or other Insurance Premiums paid		
(v.) Contributions to Pension or Superannuation Fund ..		
(vi.) Rent of premises for purposes other than purposes of residence or enjoyment		
(vii.) Rates and Taxes paid		
TOTAL DEDUCTIONS .. £		
NET INCOME .. .. £		

† But not including any retiring gratuity, or allowance paid in one amount.

(See other side of Card.)

(Back of Card.)

See other side of Card.

5. **Property.**—What was the approximate value of Real and Personal Property owned or held by you in Australia at 30th June, 1915, comprising :—

If Return is made in respect of your own property fill in column (A) but not column (B). If Return is made in respect of trustee-property or property of a company, &c., fill in column (B) but not column (A).	(A)—On Own Account.	(B)—On Account of Other Persons, Companies, &c.
Assets on 30th June, 1915—	£	£
(i.) Cash in hand		
(ii.) Money at current account in Banks, &c.		
(iii.) Fixed deposits in Banks, Buildings Societies, &c.		
(iv') (*a*) Government and other Public Debentures, &c.		
(*b*) Shares and Debentures in Companies		
(v.) Debts due to you—(*a*) Mortgages on Land		
(*b*) Other Debts.		
(vi.) Value of Stock-in-trade		
(vii.) Value of Live Stock		
(viii.) Plant, including Machinery, Tools, Implements, Rolling Stock, used for trade purposes		
(ix.) Furniture and Fittings used for trade purposes		
(x.) Estimated Value of Goodwill of Business		
(xi.) (*a*) Value of your Land inclusive of Improvements		
(*b*) Value, exclusive of Improvements (£)	*	*
(*c*) If not Sole Owner, value of your Interest		
(xii.) (*a*) Value of your Leases from Private Persons		
(*b*) Value of your Leases from the Crown		
(xiii.) Value of Share of Net Assets in Partnership or Syndicate undertakings		
(xiv.) Household Furniture and Effects and Personal Effects (including Vehicles and Plant used for other purposes than trade or occupation)		
(xv.) Value of Interests as a Beneficiary in Trust Estates		
(xvi.) Property not enumerated above, exclusive of Life Assurance and Friendly Society Policies		
TOTAL ASSETS £		
Liabilities on 30th June, 1915—		
(i.) Bank Overdraft		
(ii.) Amounts owing by you (other than Mortgages on Land)		
(iii.) Amounts owing by you on Mortgages on Land		
* *No entry to be made here.* TOTAL LIABILITIES £		
Difference between Assets and Liabilities £		

NOTE.—With respect to Trade Assets and Liabilities only, the particulars as per the latest balancing date since the 30th June, 1914, and prior to 23rd July, 1915, may be used for the purposes of this Schedule.

6. State number† owned by you of the following—

Horses. (2 yrs. and upwards.)	Draught.	Light Harness.	Saddle.	Cattle.	Other Animals.
Stallions				Dairy	Mules
Geldings				Bulls	Camels
Mares				Working Bullocks	Sheep
				Calves (under 12 mths.)	
Foals (under 2 yrs.)				All other Cattle	Pigs

† NOTE.—The above are to be apportioned in the case of partner ownerships.

Signature and Address of the Person required to make the Return :—

Signature.....

Date..... *Address*.....

A special instruction was issued that in the case of all persons under the age of 18, possessed of property, or in receipt of income, a return must be furnished by the parent or guardian in respect of such property or income.

3. **Issue of Forms.**—The onus of obtaining the requisite forms, and of posting the completed returns promptly to the Commonwealth Statistician was, by the Act, thrown on the person responsible for furnishing the desired particulars. It was consequently unnecessary to provide for collectors as is usually done in census taking. To facilitate the return of the completed inquiry forms, envelopes with address, directions and caution printed thereon were made available with the cards at all Post Offices and postal receiving offices throughout Australia. These envelopes, slightly larger than the card (viz., $8\frac{3}{4}$ x $5\frac{1}{2}$ inches), were printed as follows :—[1]

[1] The paper for the envelopes and the cartridge paper for the cards were made locally by the Australian Paper Mills. The Wealth and Income Cards were cut and printed by the Government Printer, Sydney, and the Personal Cards by the Government Printer, Melbourne; while the making and printing of the envelopes was carried out by Messrs. Sands & McDougall Ltd., Melbourne.

On His Majesty's Service (No Stamp is required).
WAR CENSUS.
The Commonwealth Statistician, Melbourne.

Directions.

1. Every person required by the War Census Act to furnish a return is to accurately fill in and sign the proper form or forms.
2. Forms for all members of any household should preferably be enclosed in the one envelope.
3. The envelope with the contained form or forms is to be posted without delay.
4. No Stamp is required.

CAUTION.—Failure to furnish a return renders any person required by the Act to make such return liable to penalty. The penalty, if the offence is prosecuted summarily, is a fine not exceeding £50 or imprisonment for a term not exceeding three months, or both; or, if the offence is prosecuted upon indictment, the penalty is £500, or imprisonment for a term not exceeding one year, or both.

G. H. Knibbs, Commonwealth Statistician.

4. **Staff.**—For the work of tabulation, summary and analysis, a special temporary staff was engaged through the office of the Public Service Inspector, Melbourne. Each candidate for employment was required to pass an elementary education test, the main requirements of which were neatness and legibility in writing, and quickness and accuracy in adding columns of figures and in making horizontal extensions.[1] The staff consisted of six divisions—one for each State—and each division was placed in charge of an Assistant Supervisor, who was either a permanent or an "exempt" officer[2] of the Bureau. These assistant supervisors were placed under the immediate control of the permanent Supervisor of Census. Each of the divisions was subdivided into groups of approximately ten men, known as "sections," each group being under the guidance of a senior officer, known as a "section leader." The rates of pay were 10s. per day for general hands, 12s. per day for section leaders, and 2s. 6d. per day for messenger boys. At its maximum strength, the War Census staff totalled 550 persons of all grades.

5. **Accommodation.**—After full consideration of the relative merits of centralisation and decentralisation, it was deemed desirable that the whole of the tabulation, summary and analysis, should be carried out in Melbourne. Fortunately sufficient space was obtainable in the building in which the Census and Statistics Bureau is located, provided that two shifts were worked. This was accordingly done, the earlier shift working from 7.45 a.m. to 3.15 p.m., the later shift from 3.30 p.m. to 11.15 p.m.[3]

CHAPTER II.—RECRUITING AND WAR LOAN APPEALS.

1. **General.**—In addition to the work originally outlined in the War Census Act, and the regulations thereunder, supplementary duties devolved upon the War Census staff, of which the most important were :—

(i.) The issue of recruiting appeals to all males between the ages of 18 and 45, and

(ii.) The issue of war loan appeals and prospectuses to persons who, according to their wealth and income card were shewn to be in possession of £1000 or upwards.

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[1] The large number of candidates who failed to pass this simple test shewed the necessity which existed for applying it.

[2] That is, a temporary officer whose services could be retained for a considerable period.

[3] Owing to the generosity of the proprietor of the buildings, Mrs. Jane Hall, acting through her local representative, Mr. R. G. Casey, the use of a considerable portion of the required space was obtained rent free for a period of four months, the concession being made in view of the purpose for which the premises were required.

2. **Recruiting Appeal.**—On the 22nd December, 1915, a regulation was made which provided for the supply of answers to certain inquiries of which the most important was that relating to willingness or unwillingness to enlist for active service abroad, either then or at a later date. The following is a copy of the form of inquiry as set out in the regulation :—

THE DEFENCE OF AUSTRALIA AND THE EMPIRE.

THE CALL TO ARMS.

Write in your answers Legibly, place in small envelope, address, and deliver or post the envelope to Nearest Local Recruiting Centre. Do this at once.

Replies to these questions will be treated as strictly confidential.

Post answers to reach the Local Recruiting Committee within seven days.

Fill in the information required, on the proper line.

Name in full

Reference Number (Correct this if not properly written.)

Give your usual postal address.

State—

Age last birthday

If unmarried, married, divorced, widowed

Number fully dependent on you

Number partly dependent on you

Present condition of your health, whether good, indifferent, bad

If deaf, blind, or if you have lost arm or leg

Your occupation

ENLISTMENT.

Are you willing to Enlist Now ? Reply " Yes" or " No."

N.B.—If you have already enlisted please state date of enlistment and camp at which stationed.

If you reply " Yes" you will be given a fortnight's notice before being called up.

If not willing to enlist now, are you willing to enlist at a later date ? Reply " Yes" or " No," and if willing, state when

If not willing to enlist, state the reason why, as explicitly as possible.

Signature (in full)

Date

Write your names distinctly.

The regulation referred to contained a provision that for the purposes of the War Census Act 1915, the transmission of the form to the nearest local recruiting centre would be deemed to be compliance with the obligation of transmission to the Statistician. On the back of the inquiry form was printed the names of the recruiting centres within the State in question, and each form was accompanied by an envelope addressed to " The Chairman, Local Recruiting Committee . . . . . ," the person furnishing the information being required to insert the name of the nearest recruiting centre, and to post or deliver his reply. In addition a special appeal from the Prime Minister, " The Call to Arms," was forwarded with each form. The following is a copy of the appeal.

Commonwealth of Australia.

THE CALL TO ARMS.

Dear Sir,— Prime Minister, 15th December, 1915.

The present state of war imperatively demands that the exercise of the full strength of the Empire and its Allies should be put forth. In this way only can speedy victory be achieved and lasting peace secured.

If those rights and privileges for which Australian democracy has struggled so long and values dearer than life itself are to be preserved, Prussian military despotism must be crushed once and for all.

The resources of the Allies are more than adequate for this task, but they must be marshalled. To wage this war with less than our full strength is to commit national suicide by slowly bleeding to death.

Our soldiers have done great things in this war. They have carved for Australia a niche in the Temple of the Immortals. Those who have died fell gloriously, but had the number of our forces been doubled, many brave lives would have been spared, the Australian armies would long ago have been camping in Constantinople, and the world war would have been practically over.

We must put forth all our strength. The more men Australia sends to the front the less the danger will be to each man. Not only victory but safety belongs to the big battalions.

Australia turns to you for help. We want more men. Fifty thousand (50,000) additional troops are to be raised to form new units of the Expeditionary Forces. Sixteen thousand (16,000) men are required each month for reinforcements at the front.

This Australia of ours, the freest and best country on God's earth, calls to her sons for aid. Destiny has given to you a great opportunity. Now is the hour when you can strike a blow on her behalf. If you love your country, if you love freedom, then take your place alongside your fellow-Australians at the front and help them to achieve a speedy and glorious victory.

On behalf of the Commonwealth Government and in the name of the people of Australia, I ask you to answer " Yes" to this appeal, and to do your part in this greatest war of all time.

Yours truly,

(Signed) W. M. HUGHES,

Prime Minister of Australia.

These appeals were sent to all males between the ages of 18 and 45, other than enemy subjects, who had furnished replies on the War Census personal card. The total number of appeals so sent was approximately 990,000. Owing to the failure of certain of those communicated with to reply, further inquiries under registered cover were sent to about 173,000 persons.

3. **War Loan Appeal.**—At the request of the Commonwealth Treasurer an appeal to contribute to the War Loan of 1917 was sent out by the War Census staff in January, 1917, to about 176,000 persons and companies resident or domiciled in Australia, whose net assets as shewn by their Wealth and Income Cards amounted to or exceeded £1000. The following is a copy of this appeal :—

COMMONWEALTH OF AUSTRALIA WAR LOAN.
Fourth Issue.
Commonwealth Treasury, Melbourne, 22nd December, 1916.

To.....

Dear Sir or Madam,—

1. Your attention is invited to the fact that the Commonwealth is now asking for subscriptions to a Fourth War Loan.

2. It is the duty of every person in Australia to do all that is possible to speedily bring victory to British arms. Already there are hundreds of thousands of Australians who are living but to one end—victory, which will result in the overthrow of the aggressor, the maintenance of the rights of the smaller nations, and freedom from military despotism. Everything that we hold dear is involved in the struggle. The right to govern ourselves, our means of livelihood, and our personal liberty are threatened. In view of the slave raids of the Huns, even association with the members of our own families may be at stake. Patriotism and self-interest alike demand that we maintain the fight with all our strength.

3. The provision of funds is just as necessary as the provision of men, and most urgently are you appealed to for assistance. You are asked to exercise self-denial and to contribute as much of your funds as possible towards the War Loan. You are asked to realize that on you depends something. To some extent at least the proper maintenance of the fight depends upon you. If you do not give for the purpose of the war as much money as you can give, then you cannot say to yourself that you have done as well as you should have done. Thousands of others are doing all that they can, please do your share.

4. The terms of the loan have been so arranged that comparatively poor persons may subscribe. Those who cannot afford more, most probably could in ten months find £10, paying £1 per month. The enclosed prospectus gives all further particulars in relation to the Loan.

5. Do not forget it is every man's duty to subscribe—so that he and his children may sooner be the citizens of a nation victorious and at peace.

6. Confidently anticipating your good wishes in this matter, and relying upon your doing whatever you can, I am, Yours faithfully,

(Signed) R. POYNTON, Commonwealth Treasurer.

P.S.—The Commonwealth Statistician and his staff alone, who are under a declaration of secrecy, are privy to the names of the persons to whom copies of this circular are being sent.

Each circular was accompanied by a copy of the Prospectus of the Loan. As indicated on the circular, only the Commonwealth Statistician and his staff (who are under special obligations of secrecy) were privy to the names of the persons who were thus communicated with.

CHAPTER III.—MALES OF MILITARY AGE.

1. **General.**—On the receipt of the War Census Cards, the work first undertaken was that of classifying and tabulating the data relative to males of military age, that is, between the ages of 18 and 60. The whole of the War Census Staff was consequently first employed on the classification and tabulation of the personal cards, which were furnished in respect of males whose age last birthday was not less than 18 nor more than 59.

2. **Enemy origin.**—The cards were sorted initially into three main groups according to whether the persons enumerated were or were not of enemy origin. In one group were placed the cards relating to persons of enemy birthplace, in another those relating to persons of enemy parentage but not enemy birthplace, while the third and largest group contained all the remaining cards, *i.e.*, all the cards relating to persons who were of neither enemy birthplace nor enemy parentage.

The numbers so recorded for the several States and Territories were as follows :—

Recorded Males of Military Age, 15th September, 1915.

State or Territory in which Recorded.	Males aged 18 to 59 last Birthday.			
	Of Enemy Birthplace.	Of Enemy Parentage but not Enemy Birthplace.	Of neither Enemy Birthplace nor Enemy Parentage.	Total.
New South Wales ..	6,190	9,374	501,174	516,738
Victoria	2,548	8,123	366,650	377,321
Queensland	4,644	12,600	179,945	197,189
South Australia ..	1,514	7,603	108,575	117,692
Western Australia ..	1,388	1,402	87,827	90,617
Tasmania	190	840	47,119	48,149
Northern Territory ..	12	19	1,242	1,273
Federal Territory ..	2	4	612	618
Total Commonwealth	16,488	39,965	1,293,144	1,349,597

The number of males shewn at the Census of 3rd April, 1911, between the ages of 18 and 60 was 1,311,628. On the assumption that the age distribution of the male population was the same at the date of the War Census of 1915 as at the date of the ordinary Census of 1911, the number of males between 18 and 60 in September, 1915, would have been approximately 1,433,000, thus suggesting that the number of males between 18 and 60 who failed to furnish the required personal cards was approximately 83,000, or rather less than 6 per cent. of the total number of that age. Owing, however, to the effect of the war, and particularly to the effect of the departures of troops from Australia, the age distribution of the male population has altered considerably since the date of the Census of 1911. In consequence of this it would appear that the number of males who failed to supply the required personal cards was very much less than the figures quoted above.

In connection with the record of males of enemy birthplace, it is of interest to note that the number of males between the ages of 18 and 60 recorded at the 1911 Census as resident in Australia but born in Germany or in Austria-Hungary was 16,037.

3. **Health.**—The cards contained in each of the three groups specified in the preceding section were next sorted according to health on the basis of the replies furnished. Each person was asked to state on his card (i.) whether he was in good, bad, or indifferent health, and (ii.) whether he was blind or deaf, or had lost a limb.

For the purpose of determining the number of military eligibles, those persons who, besides being in good health, were not blind or deaf, and had not lost a limb, were classed as " fit." Similarly all persons who, besides being in indifferent health were not blind or deaf, and had not lost a limb, were classed as " doubtful" ; while all persons who were in bad health, or were blind or deaf, or had lost a limb were classed as " unfit."

Although each person was asked on the card to state whether his health was " good, bad, or indifferent" the replies furnished covered a much more extensive range of designations than is represented by these three terms. It was consequently necessary, before commencing the tabulation, to compile a classification of recorded states of health so as to bring the replies under one or other of three heads specified,

On the basis of this classification the figures were distributed as follows :—

Fitness of Males of Military Age, 15th September, 1915.

Condition as to Health.	Males 18 to 59 last Birthday.							
	Of Enemy Birthplace.		Of Enemy Parentage but not Enemy Birthplace.		Of neither Enemy Birthplace nor Enemy Parentage.		Total.	
	Number.	%	Number	%	Number.	%	Number.	%
Fit ..	10,804	65.53	21,654	54,18	810,806	62.70	843,264	62.48
Doubtful	4,727	28.67	15,874	39.72	403,886	31.23	424,487	31.45
Unfit ..	957	5.80	2,437	6.10	78,452	6.07	81,846	6.07
Total	16,488	100.00	39,965	100.00	1,293,144	100.00	1,349,597	100.00

It may be noted that the proportions classed as " doubtful" and " unfit" were least in the case of persons of enemy birthplace, and greatest in the case of persons of enemy parentage but not enemy birthplace. Although it is probable that those classed as "doubtful" included some who on medical examination would be passed as " fit," it is also probable that a proportion of those here classed as " fit" would fail to pass the medical test. Accurate figures for the proportion of medical rejects amongst applicants for enlistment are not available, but on inquiry the officers of the Defence Department stated that 35 per cent. would not be very wide of the truth. This proportion does not differ materially from that shewn in the above table in the case of persons who were neither of enemy birthplace nor enemy parentage. It would thus appear that the number in this latter group classed as "fit," viz., 810,806, may be assumed, with a fair degree of accuracy, to represent the number of such males between 18 and 60 who were medically fit for service.

4. **Age.**—Section 60 of the Defence Act specifies certain classes distinguished by age, conjugal condition, and dependents, as liable to be called upon for military service in the order indicated in that section. The age groups specified are 18-34 last birthday, 35-44 last birthday, and 45-59 last birthday. For the purposes of tabulation all the cards were classified according to age in these groups, the final group (45-59) being further divided into the two sub-groups 45-54 and 54-59.

A classification of the data according to age is furnished in the succeeding table :

Males of Military Age in Age Groups, 15th September, 1915.

Age last Birthday.	Males 18 to 59 last Birthday.							
	Of Enemy Birthplace.		Of Enemy Parentage but not Enemy Birthplace.		Of neither Enemy Birthplace nor Enemy Parentage.		Total.	
	Number.	%	Number.	%	Number.	%	Number.	%
18-34 ..	6,547	39.71	19,597	49.04	661,544	51.15	687,688	50.95
35-44 ..	3,846	23.33	10,562	26.42	293,774	22.72	308,182	22.84
45-54 ..	4,040	24.50	7,700	19.27	249,959	19.33	261,699	19.39
55-59 ..	2,055	12.46	2,106	5.27	87,867	6.80	92,028	6.82
Total	16,488	100.00	39,965	100.00	1,293,144	100.00	1,349,597	100.00

Of the males of enemy birthplace of military age, 63 per cent. were between the ages of 18 and 45. The corresponding proportion in the case of those of enemy parentage, but not enemy birthplace, was 75½ per cent., while in the case of those of neither enemy birthplace nor enemy parentage the proportion was slightly under 74 per cent.

This indicates that the males of enemy birthplace who were of military age were on the average of more advanced age than those in the other two groups.

5. **Conjugal condition and dependents.**—A tabulation of the data relative to conjugal condition and dependents was made only in the case of those persons who, in respect of health, were classified as "fit." These, as indicated in Section 3 above, comprised 843,264 persons, and represented 62½ per cent. of the total recorded between the ages of 18 and 60.

Classified according to conjugal condition the particulars relative to "fit" men of military age are as follows :—

Conjugal Condition of "Fit" Males of Military Age, 15th September, 1915.

Conjugal Condition.	Males 18 to 59 last Birthday.							
	Of Enemy Birthplace.		Of Enemy Parentage but not Enemy Birthplace.		Of neither Enemy Birthplace nor Enemy Parentage.		Total.	
	Number.	%	Number	%	Number.	%	Number.	%
Single ..	5,230	48.41	8,563	39.54	338,739	41.78	352,532	41.81
Widowed or Divorced	244	2.26	357	1.65	16,939	2.09	17,540	2.08
Married	5,330	49.33	12,734	58.81	455,128	56.13	473,192	56.11
Total	10,804	100.00	21,654	100.00	810,806	100.00	843,264	100.00

In view of the more advanced average age disclosed in Section 4, in the case of males of enemy birthplace, than in either of the other groups, it is surprising to note that this group also has a preponderant proportion of single men.

6. **Occupation.**—With a view to recording the number of men of military age who were engaged in occupations which might directly or indirectly be of special importance in connection with the war, a brief classification of such occupations was prepared, comprising eleven classes and 71 groups of occupations. The final group (No. 71) contained all the balance not specifically included in the preceding groups. For the purposes of this classification the index of occupations used at the Census of 1911 was recast on the basis of the 71 groups here mentioned. The numbers recorded in each group are shewn in the following table :—

Males of Military Age—Occupations, 15th September, 1915.

OCCUPATION.	MALES 18 TO 59 LAST BIRTHDAY.			
	Of Enemy Birthplace.	Of Enemy Parentage but not Enemy Birthplace.	Of neither Enemy Birthplace nor Enemy Parentage.	TOTAL.
I.—Defence and Civil Protection.				
1. Army	6	312	46,279	46,597
2. Navy	..	9	1,261	1,270
3. Maker of arms, ammunition, explosives	6	18	1,441	1,465
4. Police, prison official	7	189	6,971	7,167
II.—Religion.				
5. Clergy	102	121	5,174	5,397
III.—Health.				
6. Medical practitioner	28	63	2,283	2,374
7. Medical student	3	35	743	781
8. Dentist	10	63	2,666	2,739
9. Pharmaceutical chemist, druggist	15	47	2,485	2,547
10. Male nurse, hospital orderly, warder	7	39	1,852	1,898
11. Veterinary surgeon	1	4	264	269
IV.—Science.				
12. Analytical chemist	5	9	298	312
13. Assayer, metallurgist	2	14	552	568
14. Maker of scientific or surgical instruments	24	26	624	674
15. Manufacturing chemist	7	8	664	679
V.—Construction of Buildings, Roads, Railways and Earthworks.				
16. Surveyor, civil engineer	24	54	2,954	3,032
17. Architect, Builder	51	135	4,708	4,894
18. Draughtsman	12	42	1,974	2,028
19. Stonemason	32	127	3,413	3,572
20. Brickmaker	18	87	3,768	3,873
21. Bricklayer	35	85	6,784	6,904
22. Sawmiller, employee	263	734	19,994	20,991
23. Carpenter, joiner, cabinet maker	403	1,198	36,590	38,191
24. Plasterer, concrete worker	20	62	4,158	4,240
25. Plumber	37	232	8,173	8,442
26. Painter	111	231	12,657	12,999
27. Builder's labourer	32	94	4,821	4,947
28. Road, railways, earthworks, contractor, labourer; navvy	542	1,397	53,465	55,404
VI.—Transport and Communication.				
29. Railway engine-driver, fireman, cleaner	13	223	10,427	10,663
30. Other railway employee	107	673	34,290	35,070
31. Tramway employee	18	148	9,475	9,641
32. Coach, omnibus, cab driver; groom, drayman, carrier, carter, teamster	237	1,578	61,158	62,973
33. Chauffeur, taxi-cab driver, motorist, aviator	34	121	6,238	6,393
34. Marine engine driver, stoker (mer. ser.)	189	36	3,445	3,670
35. Shipmaster, officer, seaman (mer. ser.)	573	99	7,7 8	8,470
36. Postal, telegraph, telephone official	31	343	15,718	16,092
37. Printer, printing employee	28	220	9,864	10,112
38. Coach, carriage, waggon builder; wheelwright	75	393	11,415	11,883
39. Saddler, harness maker	26	198	3,815	4,039
40. Ship, boat builder	22	32	2,483	2,537

Males of Military Age.—Occupations, 15th September, 1915—*continued.*

OCCUPATION.	MALES 18 TO 59 LAST BIRTHDAY.			
	Of Enemy Birthplace.	Of Enemy Parentage but not Enemy Birthplace.	Of neither Enemy Birthplace nor Enemy Parentage.	TOTAL.
VII.—Clothing and Textile Materials.				
41. Woollen, cotton manufacturer ..	11	31	1,256	1,298
42. Tailor, clothing manufacturer ..	204	249	8,300	8,753
43. Hatter, cap maker	6	14	897	917
44. Bootmaker, shoemaker	102	322	11,633	12,057
45. Tent, tarpaulin maker ; sail maker	19	6	449	474
46. Tanner, currier, fellmonger, wool-scourer	31	105	3,852	3,988
VIII.—Food, etc.				
47. Pastoralist, pastoral labourer ..	352	1,795	65,567	67,714
48. Slaughterman, butcher, meat curer, preserver	245	612	16,791	17,648
49. Dairy farmer, assistant	178	920	25,187	26,285
50. Butter, cheese, condensed milk maker	5	55	1,521	1,581
51. Agriculturist, agricultural labourer	3,695	13,473	199,669	216,837
52. Flour miller	13	39	1,270	1,322
53. Baker, pastry cook	325	344	8,594	9,263
54. Jam, pickle, sauce maker ..	2	11	592	605
55. Sugar miller, refiner	96	103	2,662	2,861
56. Tobacco, cigar, cigarette maker ..	50	38	1,097	1,185
57. Fisherman, fish curer, preserver ..	93	102	3,567	3,762
58. Water supply worker	16	64	3,084	3,164
IX.—Machinery, Metals, Minerals.				
59. Mechanical engineer, draughtsman	49	73	3,149	3,271
60. Engine fitter, turner ; boilermaker, millwright, implement maker ..	226	390	21,295	21,911
61. Cutler	7	15	633	655
62. Tinsmith, zincworker, galvaniser ..	35	65	3,146	3,246
63. Iron, steel, founder, moulder ..	63	172	8,855	9,090
64. Brassfounder, moulder ; brazier ; coppersmith, worker	13	33	2,504	2,550
65. Wire manufacturer, worker ..	6	17	679	702
66. Blacksmith, striker, farrier ..	130	590	15,002	15,722
67. Miner, quarryman	754	1,059	52,450	54,263
X.—Heat, Light and other Forms of Energy.				
68. Gas manfr., cokemaker, charcoal burner	13	53	3,467	3,533
69. Electrician ; elect. light, energy producer	62	120	6,305	6,487
70. Engine driver, fireman, cleaner (other than locomotive or marine) ..	313	402	16,835	17,550
XI.—Residuum.				
71. All other occupations	6,218	9,194	389,694	405,106
TOTAL	16,488	39,965	1,293,144	1,349,597

Of the total of 1,349,597, the residuary group accounted for 405,106, or 30 per cent. Agriculturists and their assistants aggregated 216,837, or 16 per cent. of the total, while pastoralists, dairy farmers and their assistants totalled 93,999, or 7 per

cent. of the total for all occupations. Miners and quarrymen numbered 54,263, or 4 per cent. of the total, while saw-millers and their employees numbered 20,991, or 1½ per cent. It will thus be seen that the four leading branches of primary production accounted for no fewer than 386,090, or 28½ per cent. of the total males of military age recorded.

7. **Records and Index.**—In addition to the work indicated above a complete lexicographically arranged card index was prepared in respect of the 1,349,597 personal cards, and changes of address numbering many thousands were made both on the record and the index cards. Complete lists of persons of enemy birthplace and parentage were prepared for the information of the military authorities, and a record was made of the names and addresses of owners of arms and ammunition and the number and amount so held.

PART III.—WAR CENSUS OF 1915.—WEALTH AND INCOME.

CHAPTER I.—GRADES OF OWNERSHIP.

1. **General.**—Before any satisfactory classification of the wealth or income of the community could be made on a progressive basis, it was necessary to devise a scheme for the grouping of the data in such a manner as to obviate as fully as practicable the possibilities of duplication on the one hand or omission on the other.

2. **Groups adopted.** — For this purpose the wealth and income cards were initially divided into six main groups, with supplementary sub-groups as follows :—

I. Individual Males.
II. Individual Females.
III. (A.) Partnerships.
(B.) Male Partners.
(C.) Female Partners.
IV. (A.) Trustees.
(B.) Male Beneficiaries.
(C.) Female Beneficiaries.
V. Companies.
VI. Institutions.

3. **Individuals.**—In Divisions I. and II. were included at the initial operation those cards and those only which related to individual persons who furnished no evidence of being interested in a trust estate, whether as a trustee or as a beneficiary, or in a partnership. At a later stage when the check purposes of the initial sorting had been served, the individual cards relating to partners and to beneficiaries were combined with those initially classed in Divisions I. and II.

In principle, Divisions I. and II. were identical, the only distinction between them being the difference of sex, Division I. relating to males and Division II. to females.

4. **Partnerships.**—All cards relating to partnerships as well as all individual cards relating to the male or female partners were initially classed in Division III., the object of this primary classification being that of enabling the cards relating to partnerships to be compared with those relating to the individual partners. As indicated above the cards relating to partners were eventually classed with those relating to individuals. In the case of firms trading in Australia but domiciled outside the Commonwealth, the card relating to the firm was the only card furnished. In these cases the partnership cards were separately tabulated and the results appear in the tables under the designation " Non-resident partnerships." Partnerships domiciled in Australia, being included in respect both of wealth and income in the returns of the individual partners, are omitted from the tables.

5. **Trusts.**—All cards containing particulars relative to a trust were placed originally in Division IV., and were subsequently sorted into the three sub-groups (*a*) trustees, (*b*) male beneficiaries, (*c*) female beneficiaries. In certain cases the card furnished by a trustee contained the particulars of his or her own private wealth and income in the inner column, and those relative to the trust estate in the outer column of the card, in other cases a separate card was furnished in respect of the trust.

Where the combined cards had been furnished a separate card was written by the War Census staff in respect of the trust particulars, which were then deleted from the trustee's card. If the trustee was not interested as a beneficiary in this or any other trust estate or in a partnership, his or her amended card was forthwith transferred to Division I. or II., as the case might be. The object of associating the cards relating to trust estates with those relating to beneficiaries was, as in the case of partnerships, to allow of a check being obtained. Owing to the impossibility of obtaining in respect of trust estates a satisfactory evaluation of the shares of the several beneficiaries, it was deemed expedient to eliminate from the returns of individual beneficiaries all assets shewn as consisting of interests in trust estates, and to shew the value of trust estates in bulk. In addition to such trust property there is a large body of assets held in a fiduciary capacity by life assurance and other societies which cannot be allocated to individual proprietors owing to the fact that particulars in respect of the values of policies were advisedly excluded from the inquiry. The total value of such property, aggregating approximately £52,000,000, has in the final results been incorporated with the bulk statement of Trust Funds. Similarly the net income of such societies has been included in bulk in the income statement. In this connection it may be noted that in so far as premium income of these societies is concerned, each individual furnishing an income return was instructed amongst other things to deduct from his gross income the amount paid in respect of such premiums.

6. **Companies.**—In the initial sorting all cards relating to companies were classed together, and were subsequently divided into two groups according to whether their head offices were within or outside of Australia. As the dividends paid by the companies will appear in the returns of the shareholders receiving them, and the value of the shares and debentures of the companies will appear in the assets of their shareholders, it is clear that special precautions are necessary to avoid duplication in the compilation of company returns. With this object in view a special tabulation was made of the total assets shewn on the cards as comprising shares and debentures of companies, and a special return was obtained from all Australian companies shewing the undistributed profit during the year under review, including sums transferred to reserves. In the final tabulation of the results the net assets of all companies were reduced by the amount of shares and debentures in companies shewn as being held in Australia, the balance representing approximately the amount of outside capital invested in companies operating in Australia. In the case of income, the wealth and income card did not furnish a means of determining the total income derived from dividends of companies. The special return of undistributed profit mentioned above was consequently taken as furnishing for Australian companies the net income not included in shareholders' returns, while for companies having their head offices outside of Australia the total *net profits* were taken into account.

7. **Institutions.**—Returns furnished by such institutions and bodies as churches, schools, mechanics' and literary institutes, sports clubs, etc., were all classed under the comprehensive head of "institutions," the number of these being considerable. In very many cases there was, strictly speaking, no net income, as the gross income received was practically all absorbed in the working expenses for the year. In not a few cases also, there was little in the nature of net assets, the liabilities representing a large proportion of the gross assets. For the whole of Australia, this division represented net income of about £600,000 and net assets of about £25,000,000.

CHAPTER II.—NET INCOME.

1. **According to States.**—(i.) *Total Net Income.* In the inquiry in respect of wealth and income made by the War Census, provision was made for the record of the State in which the person making the return was residing, but no provision for the allocation of the income to the States in which it was earned or for the allocation of the wealth to the States in which it was situated. The tabular results, therefore, in respect of the several States, must be understood merely as giving particulars in respect of States of domicile of the earners of the income or the owners of the wealth.[1]

In the cases of absentees the States to which the returns have been allocated are those in which the Australian representative of the absentee was domiciled. Similarly the returns for Australian companies, partnerships and institutions have been allocated to the States in which their respective head offices are situated, while the returns for companies and partnerships domiciled outside Australia have been allocated to the States in which their head offices for Australia are situated.

On this basis, and in accordance with the classification of ownership indicated in Chapter IV., the following classification of income according to States has been compiled. In all cases the figures shewn represent the net income, that is, the deductions indicated in the income section of the Wealth and Income Card (see p. 9) have been made in all cases before tabulation.

Aggregate of Net Incomes for the year ended 30th June, 1915.

Division.	N.S.Wales.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	F. Ter.	C'wealth.
Individuals—	£	£	£	£	£	£	£	£	£
Males ..	80,605,047	57,638,256	28,413,371	15,993,418	12,928,133	5,971,606	197,290	94,516	201,841,637
Females ..	14,436,399	14,665,893	4,259,694	3,290,096	1,550,206	1,171,084	12,878	8,665	39,394,915
Non-resident									
Partnerships	51,030	79,690	12,352	8	156	3	..	..	143,239
Trust Funds	1,923,204	908,766	136,280	38,552	19,257	15,845	..	..	3,041,904
Companies	4,141,696	5,391,808	1,375,513	785,830	808,807	108,928	..	..	12,612,582
Institutions	224,990	303,544	47,129	21,730	3,668	14,380	486	47	615,974
Total ..	101,382,366	78,987,957	34,244,339	20,129,634	15,310,227	7,281,846	210,654	103,228	257,650,251

As indicated in Chapter IV., the income from Australian partnerships has been allocated in tabulation to the returns of the individual partners and consequently, in the above table, is included under the head of "Individuals." Similarly the income derived from trust funds has in the main been included in the individual returns of the beneficiaries. The income specially shewn in the above table as from "trust funds" consists mainly of the net revenues of Assurance and Friendly Societies, and of those estates administered by such public authorities as the Curator of Intestate Estates, the Public Trustee, the Master in Lunacy, etc., where no allocation of the income to individual beneficiaries had been made.

In the case of Companies the income here shewn is the aggregate net profit in the case of absentee companies, while in the case of Australian companies it consists of the undistributed profit, inclusive of transfers to reserves.

(ii.) *Net Income of Individuals.*—The net income of individuals shewn in the preceding table totals £241,236,552, of which £201,841,637 was the income of males, and £39,394,915 was the income of females. This aggregate was recorded from 2,195,065 returns, of which 2,191,945 were furnished by persons actually or usually resident in Australia, while 3120 of the returns related to non-residents.

[1] For example, the income derived from pastoral property situated in Queensland, but owned by a resident of Sydney, will necessarily be tabulated under the head of New South Wales, as the War Census Schedule furnished no indication of the location of the source of income.

Particulars concerning the number of returns relative to residents and non-residents respectively, allocated to each State or Territory are furnished in the next table, the data being given separately for males and females.

Number of Wealth and Income Returns for Individuals for year ended 30th June, 1915, allocated to each State and Territory.

State or Territory.	Returns relating to Residents of Australia.			Returns relating to Non-Residents.			Total Returns.		
	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.
N. S. Wales..	524,047	268,509	792,556	550	651	1,201	524,597	269,160	793,757
Victoria ..	396,900	302,946	699,846	349	738	1,087	397,249	303,684	700,933
Queensland..	197,116	102,242	299,358	73	92	165	197,189	102,334	299,523
S. Australia..	125,978	80,709	206,687	77	158	235	126,055	80,867	206,922
W. Australia	84,532	30,623	115,155	115	90	205	84,647	30,713	115,360
Tasmania ..	49,673	26,428	76,101	162	65	227	49,835	26,493	76,328
Nor.Territory	1,290	86	1,376	..	..	..	1,290	86	1,376
Fed.Territory	672	194	866	..	..	..	672	194	866
Total C'wlth	1,380,208	811,737	2,191,945	1,326	1,794	3,120	1,381,534	813,531	2,195,065

The estimated population of the Commonwealth at 30th September, 1915, was 4,954,029, of whom 2,527,831 were males, and 2,426,198 were females. It will thus be seen that 54.60 per cent. of the males, and 33.46 per cent. of the females in the Commonwealth at the date of the Census furnished Wealth and Income Cards. For the sexes combined the number of such individual returns in respect of Australian residents represented 44.24 per cent. of the total population. The corresponding percentages in respect of the total population of the several States and Territories were as follows :—New South Wales, 42.35 per cent. ; Victoria, 49.17 per cent. ; Queensland, 43.27 per cent. ; South Australia, 47.07 per cent. ; Western Australia, 35.64 per cent. ; Tasmania, 38.45 per cent. ; Northern Territory, 28.99 per cent. ; Federal Territory, 34.46 per cent.

The aggregate net income represented by the returns shewn in the preceding table are as follows :—

Aggregate Net Income of Individuals for year ended 30th June, 1915, recorded in respect of each State and Territory.

State or Territory.	Aggregate Net Income recorded in respect of Residents of Australia.			Aggregate Net Australian Income recorded in respect of Non-residents.			Total Net Income recorded.		
	Males.	Females.	Persons.	Males.	Females	Persons.	Males.	Females.	Persons.
	£	£	£	£	£	£	£	£	£
N. S. Wales..	80,408,696	14,129,441	94,538,137	196,351	306,958	503,309	80,605,047	14,436,399	95,041,446
Victoria ..	57,556,847	14,406,704	71,963,551	81,409	259,189	340,598	57,638,256	14,665,893	72,304,149
Queensland..	28,400,037	4,208,209	32,608,246	13,334	51,485	64,819	28,413,371	4,259,694	32,673,065
S. Australia..	15,971,363	3,198,793	19,170,156	22,055	91,303	113,358	15,993,418	3,290,096	19,283,514
W. Australia	12,908,078	1,536,849	14,444,927	20,055	13,357	33,412	12,928,133	1,550,206	14,478,339
Tasmania ..	5,965,870	1,158,968	7,124,838	5,736	12,116	17,852	5,971,606	1,171,084	7,142,690
Nor.Territory	197,290	12,878	210,168	..	..	..	197,290	12,878	210,168
Fed.Territory	94,516	8,665	103,181	..	..	..	94,516	8,665	103,181
Total C'wlth	201,502,697	38,660,507	240,163,204	338,940	734,408	1,073,348	201,841,637	39,394,915	241,236,552

The total of £240,163,204 for residents of Australia represents an average net income per head of population of £48 9s. 7d. The corresponding averages per head of population for the several States and Territories are as follows :—New South Wales, £50 10s. 4d. ; Victoria, £50 11s. 2d. ; Queensland, £47 2s. 9d. ; South Australia, £44 13s. 2d. ; Western Australia, £44 14s. 1d. ; Tasmania, £36 0s. 1d. ; Northern Territory, £44 5s. 8d. ; Federal Territory, £41 1s. 2d.

The average net income per individual return recorded in respect of each State and Territory is shewn in the following table :—

Average Net Income per Individual Return for year ended 30th June, 1915, recorded in respect of each State and Territory.

State or Territory.	Average Net Income per Return recorded in respect of Residents of Australia.			Average Net Australian Income recorded in respect of Non-residents.			Average Net Income per Return for all Returns.		
	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons
	£	£	£	£	£	£	£	£	£
N.S.W. ..	153	53	119	357	472	419	154	54	120
Vic. ..	145	48	103	233	351	313	145	48	103
Q'land ..	144	41	109	183	560	393	144	42	109
S.A. ..	127	40	93	286	578	482	127	41	93
W.A. ..	153	50	125	174	148	163	153	50	126
Tas. ..	120	44	94	35	186	79	120	44	94
N.T. ..	153	150	153	..	..	..	153	150	153
F.T. ..	141	45	119	..	..	..	141	45	119
Aver. C'wlth	146	48	110	256	409	344	146	48	110

2. **According to size of net income.** (i.) *Grouping.*—Particulars relative to the incomes of individuals were classified under sixteen net income groups, one of which comprised those cases in which the return shewed that there had been no net income, or that there was a deficit.

(ii.) *Income of persons resident in Australia.*—The number of cases in which the returns for each sex related to persons actually or usually resident in Australia, and the proportion per cent. which the number of returns for each net income group was of the aggregate to which it contributed is shewn in the following table :—

Income of Persons resident in Australia.—Number of Returns classified according to Net Income.

Net Income for 12 months ended 30th June, 1915.	Number.			Proportion per cent.		
	Males.	Females.	Persons.	Males.	Females.	Persons.
				%	%	%
Deficit and nil	66,460	249,476	315,936	4.8152	30.7336	14.4135
Under £50 ..	145,513	301,592	447,105	10.5428	37.1539	20.3976
£50 & under £100	327,835	168,106	495,941	23.7526	20.7094	22.6256
£100 ,, £150	448,195	52,929	501,124	32.4730	6.5205	22.8621
£150 ,, £156	46,630	3,651	50,281	3.3785	.4498	2.2939
£156 ,, £200	157,350	12,697	170,047	11.4005	1.5642	7.7578
£200 ,, £300	106,324	11,001	117,325	7.7035	1.3552	5.3526
£300 ,, £500	49,108	6,617	55,725	3.5580	.8152	2.5423
£500 ,, £750	15,928	2,691	18,619	1.1540	.3315	.8494
£750 ,, £1000	6,313	1,145	7,458	.4574	.1411	.3402
£1000 ,, £1500	4,933	905	5,838	.3574	.1115	.2663
£1500 ,, £2000	2,132	364	2,496	.1545	.0448	.1139
£2000 ,, £3000	1,707	317	2,024	.1237	.0390	.0923
£3000 ,, £4000	659	102	761	.0477	.0126	.0347
£4000 ,, £5000	375	58	433	.0272	.0071	.0198
£5000 and over	746	86	832	.0540	.0106	.0380
Total ..	1,380,208	811,737	2,191,945	100.0000	100.0000	100.0000
Total £156 & over	345,575	35,983	381,558	25.0379	4.4328	17.4073

It will be seen that of the returns received relative to resident males, 25 per cent. related to net incomes of £156 and upwards, while somewhat less than 4½ per cent. of those relative to resident females were in respect of incomes of £156 and upwards. For the sexes combined net incomes of £156 and upwards were represented by somewhat less than 17½ per cent. of the returns.

The aggregate net income represented by the returns specified in the foregoing table was £240,163,204, of which the sum of £201,502,697 was recorded in the cards of males, while the cards of females accounted for £38,660,507. The average net income per card for resident males was thus £146, as compared with an average per card of £48 for resident females, and an average for residents of both sexes of £110. The aggregate net income for each income group, and the proportion per cent. in each case is given in the following table in respect of persons actually or usually resident in Australia :—

Income of Persons resident in Australia—Aggregate Net Income disclosed by Returns.

Net Income for 12 months ended 30th June, 1915.	Aggregate Amount.			Proportion per cent.		
	Males.	Females.	Persons.	Males.	Females.	Persons.
	£	£	£	%	%	%
Under £50	4,163,492	6,716,909	10,880,401	2.0662	17.3741	4.5304
£50 & under £100	24,308,245	11,416,318	35,724,563	12.0635	29.5297	14.8751
£100 ,, £150	55,089,955	6,250,478	61,340,433	27.3396	16.1676	25.5411
£150 ,, £156	7,092,731	557,963	7,650,694	3.5199	1.4432	3.1856
£156 ,, £200	27,219,438	2,211,307	29,430,745	13.5082	5.7198	12.2545
£200 ,, £300	25,190,643	2,641,110	27,831,753	12.5014	6.8315	11.5887
£300 ,, £500	18,388,257	2,498,288	20,886,545	9.1256	6.4621	8.6968
£500 ,, £750	9,603,396	1,632,945	11,236,341	4.7659	4.2238	4.6786
£750 ,, £1000	5,392,909	969,926	6,362,835	2.6763	2.5088	2.6494
£1000 ,, £1500	5,993,503	1,089,209	7,082,712	2.9744	2.8174	2.9491
£1500 ,, £2000	3,676,422	629,439	4,305,861	1.8245	1.6281	1.7929
£2000 ,, £3000	4,149,389	771,511	4,920,900	2.0592	1.9956	2.0490
£3000 ,, £4000	2,248,692	360,818	2,609,510	1.1160	.9333	1.0866
£4000 ,, £5000	1,685,277	258,390	1,943,667	.8364	.6684	.8093
£5000 and over	7,300,348	655,896	7,956,244	3.6229	1.6966	3.3129
Total	201,502,697	38,660,507	240,163,204	100.0000	100.0000	100.0000
Total £156 & over	110,848,274	13,718,839	124,567,113	55.0108	35.4854	51.8678

It will be seen that net incomes of £156 and upwards aggregated 55 per cent. of the total in the case of males, about 35½ per cent. in the case of females, and somewhat less than 52 per cent. for the sexes combined. From these figures taken in conjunction with those relative to the number of returns, it appears that in the case of male residents 25 per cent. of the returns accounted for 55 per cent. of the net income, that in the case of female residents 4½ per cent. of the returns accounted for 35½ per cent. of the net income, and that, for the sexes together, 17½ per cent. of the returns accounted for about 52 per cent. of the net income.

(iii.) *Australian income of non-residents.*—The following table contains particulars of the number and proportion of net incomes in each group represented by the returns of the Australian incomes of persons who are not actually or usually resident in the Commonwealth. Returns relating to persons usually resident in Australia, but temporarily absent at the time of the War Census, are included in the tables in sub-section (ii.) dealing with residents.

Of the returns received relative to non-resident males about 30¾ per cent. related to net incomes of £156 and upwards. The corresponding percentages in the case of females was about 46⅕ per cent., and for the sexes combined about 39⅔ per cent.

Income of Persons non-resident in Australia—Number of Returns Classified according to Net Income.

Net Income for 12 months ended 30th June, 1915.	Number.			Proportion per cent.		
	Males.	Females.	Persons.	Males.	Females.	Persons.
				%	%	%
Deficit and nil ..	285	83	368	21.4932	4.6265	11.7949
Under £50	298	404	702	22.4736	22.5195	22.5000
£50 & under £100	171	269	440	12.8959	14.9944	14.1026
£100 ,, £150	148	187	335	11.1614	10.4236	10.7372
£150 ,, £156	16	22	38	1.2066	1.2263	1.2179
£156 ,, £200	60	89	149	4.5249	4.9610	4.7756
£200 ,, £300	102	171	273	7.6923	9.5318	8.7500
£300 ,, £500	85	205	290	6.4102	11.4270	9.2949
£500 ,, £750	65	136	201	4.9020	7.5808	6.4423
£750 ,, £1000	24	63	87	1.8100	3.5117	2.7885
£1000 ,, £1500	25	60	85	1.8854	3.3445	2.7244
£1500 ,, £2000	18	53	71	1.3575	2.9543	2.2756
£2000 ,, £3000	16	28	44	1.2066	1.5608	1.4102
£3000 ,, £4000	6	9	15	.4525	.5017	.4808
£4000 ,, £5000	3	2	5	.2262	.1115	.1602
£5000 and over	4	13	17	.3017	.7246	.5449
Total	1,326	1,794	3,120	100.0000	100.0000	100.0000
Total £156 & over	408	829	1,237	30.7693	46.2097	39.6474

The aggregate net income represented by the returns specified in the preceding table was £1,073,348, of which £338,940 was accounted for on returns relating to males, and £734,408 on returns relating to females. The average net income per card for non-resident males was thus £256, as compared with £409 per card for non-resident females, and £344 per card when the returns for the sexes were combined.

The aggregate net income in each income group, and the proportionate distribution over the several groups for each sex and for the sexes combined are given in the following table :—

Income of Persons non-resident in Australia—Aggregate Net Income disclosed by Returns.

Net Income for 12 months ended 30th June, 1915.	Aggregate Net Income.			Proportion per cent.		
	Males.	Females.	Persons.	Males.	Females.	Persons.
	£	£	£	%	%	%
Under £50	6,409	10,281	16,690	1.8909	1.3999	1.5550
£50 & under £100	12,237	19,327	31,564	3.6104	2.6317	2.9407
£100 ,, £150	17,562	22,490	40,052	5.1814	3.0623	3.7315
£150 ,, £156	2,427	3,332	5,759	.7160	.4537	.5365
£156 ,, £200	10,484	15,820	26,304	3.0932	2.1541	2.4507
£200 ,, £300	25,333	41,884	67,217	7.4742	5.7031	6.2624
£300 ,, £500	32,484	80,987	113,471	9.5840	11.0275	10.5717
£500 ,, £750	39,427	83,644	123,071	11.6324	11.3893	11.4661
£750 ,, £1000	20,896	54,837	75,733	6.1651	7.4668	7.0558
£1000 ,, £1500	30,879	75,723	106,602	9.1105	10.3108	9.9317
£1500 ,, £2000	31,017	91,242	122,259	9.1512	12.4239	11.3904
£2000 ,, £3000	39,925	64,193	104,118	11.7794	8.7408	9.7003
£3000 ,, £4000	20,834	31,492	52,326	6.1468	4.2881	4.8750
£4000 ,, £5000	14,179	9,394	23,573	4.1833	1.2791	2.1962
£5000 and over	34,847	129,762	164,609	10.2812	17.6689	15.3360
Total	338,940	734,408	1,073,348	100.0000	100.0000	100.0000
Total £156 & over	300,305	678,978	979,283	88.6013	92.4524	91.2363

(iv.) *Average net income in each group.*—In the tabulation of data relative to income, etc., in groups, an approximation to the aggregate amount represented by each group is sometimes obtained by ascertaining the number of returns in each group, and then multiplying by some factor which lies between the limits of the group, frequently by the mean of those limits. Such a method reduces the work enormously, but lacks accuracy, and on the present occasion was not adopted. The process followed was that of adding together all the net incomes shewn on the returns for each group. The average net incomes per return deduced from these aggregates are shewn in the following table :—

Incomes—Average Net Income per Return.

Net Income for 12 months ended 30th June, 1915.	Average per Return for Australian Residents.			Average Australian Income per Return for Non-residents.		
	Males.	Females.	Persons.	Males.	Females.	Persons.
	£	£	£	£	£	£
Under £50 ..	29	22	24	22	25	24
£50 & under £100	74	68	72	72	72	72
£100 ,, £150	123	118	122	119	120	120
£150 ,, £156	152	153	152	152	151	152
£156 ,, £200	173	174	173	175	178	177
£200 ,, £300	237	240	237	248	245	246
£300 ,, £500	374	378	375	382	395	391
£500 ,, £750	603	607	603	607	615	612
£750 ,, £1000	854	847	853	871	870	870
£1000 ,, £1500	1,215	1,204	1,213	1,235	1,262	1,254
£1500 ,, £2000	1,724	1,729	1,725	1,723	1,722	1,722
£2000 ,, £3000	2,431	2,434	2,431	2,495	2,293	2,366
£3000 ,, £4000	3,412	3,537	3,429	3,472	3,499	3,488
£4000 ,, £5000	4,494	4,455	4,489	4,726	4,697	4,715
£5000 and over	9,786	7,627	9,563	8,712	9,982	9,683
Average Income–						
All returns ..	146	48	110	256	409	344
£156 and over	321	381	326	736	819	792

It will be seen that in the majority of cases the average income for a group fell well below the arithmetical mean of the limiting values of the group. Amongst the particulars relative to residents there were two cases in which the computed average exceeded such arithmetical means, viz., for males " under £50," and for females " £3000 and under £4000," while there was one case, viz., females, " £150 and under £156," in which the computed average coincided with the arithmetical mean of the limits. Amongst non-residents the computed average exceeded the arithmetical mean of the group limits in the cases of females and of persons " £1000 and under £1500," and in the cases of males, of females, and of persons, " £4000 and under £5000," while there was equality in the cases of females "under £50," and of females, " £156 and under £200."

CHAPTER III.—NET ASSETS.

1. **According to States.**—(i.) *Aggregate net assets.* The remarks made in section 1, sub-section (i.) of Chapter II. (p. 22), relative to distribution according to States and Territories, are applicable to both income and assets, and should be read in connection with the allocation according to States and Territories given in the present Chapter. Subject to the limitations there indicated the following table furnishes a distribution of the private wealth of Australia according to the States of domicile of the owners:—

Aggregate of Net Assets recorded as at 30th June, 1915.

Division.	N.S.Wales.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	N. Ter.	F. Ter.	C'wealth.
	£	£	£	£	£	£	£	£	£
Individuals—									
Males ..	364,446,799	290,118,896	103,483,745	93,992,280	42,409,316	26,499,458	763,892	271,047	921,985,433
Females	108,931,209	113,525,130	30,200,223	29,185,188	10,630,291	9,625,174	71,833	71,513	302,240,561
Non-resident Partnerships	592,034	678,174	9,429	57	2,000	1,310	..	..	1,283,004
Trust Funds	114,245,620	89,586,342	10,436,039	22,718,653	4,249,405	6,899,258	2,050	..	248,137,367
Companies	48,052,445	62,805,920	17,822,371	5,804,360	9,247,547	900,843	2,379	..	144,635,865
Institutions	9,430,961	8,622,998	1,851,628	2,922,591	1,330,521	1,019,448	2,580	419	25,181,146
Total	645,699,068	565,337,460	163,803,435	154,623,129	67,869,080	44,945,491	842,734	342,979	1,643,463,376

The net assets shewn in the preceding table are exclusive of the property of Federal, State or Local Governments, and may consequently be considered as representing the *total private wealth of Australia* as at 30th June, 1915. This total of £1,643,463,376 includes the Australian property of non-resident individuals, partnerships and companies. The amount, however, so held by non-residents, cannot be determined with any degree of accuracy, but on the basis of the War Census returns it is roughly estimated that it lies between £150,000,000 and £200,000,000. It would thus appear that the aggregate private wealth of Australian residents as at 30th June, 1915, was approximately £1,470,000,000, or nearly £300 per head of population.

As in the case of incomes in Chapter II., the assets of Australian partnerships are included in the returns of the individual partners. The partnership figures shewn in the above table relate to non-resident partnerships only.

The item " Trust Funds," is made up of several categories of which the most important are the total values of trust-estates, and the Australian funds of Life Assurance Companies, Friendly Societies, and Trade Unions.

As these funds were in every case excluded from the returns of individuals either by instruction as in the case of Life Assurance policies, etc., or by special adjustment prior to tabulation as in the case of beneficiaries in trust estates, the possibility of duplication of such returns has been eliminated.

In the case of " Companies," the net assets of the Australian companies were taken from special returns obtained from these companies, such net assets being computed without deducting the liabilities to share and debenture holders. From the total net assets so computed, the aggregate amount of " Shares and debentures in companies" shewn on the various individual and other cards was deducted, the balance representing approximately the interest in Australian companies held by persons not resident in the Commonwealth, together with the margin, if any, between the share valuations of the several shareholders, and the valuation of net assets made by the company officials.

With absentee companies, that is, companies registered outside Australia, but trading in the Commonwealth, the procedure followed was that of including the net assets of the company held in Australia.

(ii.) *Net assets of individuals.*—The aggregate net assets of individuals shewn in the preceding table amounts to £1,224,225,994, of which £921,985,433 was recorded in respect of males, and £302,240,561 in respect of females. Particulars concerning the number of returns of residents and of non-residents of each sex allocated to each State or Territory are shewn in Chapter II., p. 23, the figures in this case being, of course, the same for incomes as for assets.

The aggregate net assets represented by such returns are shewn in the following table :—

Aggregate* Net Assets of Individuals as at 30th June, 1915, recorded in respect of each State and Territory of Australia.

State or Territory.	Aggregate Net Assets recorded in respect of Residents of Australia.			Aggregate Net Australian Assets recorded in Respect of Non-Residents.			Total Net Assets Recorded.		
	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.
	£	£	£	£	£	£	£	£	£
N. S. Wales	362,193,858	106,750,464	468,944,322	2,252,941	2,180,745	4,433,686	364,446,799	108,931,209	473,378,008
Victoria ..	289,313,023	112,166,443	401,479,466	805,873	1,358,687	2,164,560	290,118,896	113,525,130	403,644,026
Queensland	103,382,820	30,139,736	133,522,556	100,925	60,487	161,412	103,483,745	30,200,223	133,683,968
S. Australia	93,677,702	29,018,284	122,695,986	314,578	166,904	481,482	93,992,280	29,185,188	123,177,468
W. Australia	42,132,404	10,464,596	52,597,000	276,912	165,695	442,607	42,409,316	10,630,291	53,039,607
Tasmania ..	26,355,451	9,458,596	35,814,047	144,007	166,578	310,585	26,499,458	9,625,174	36,124,632
Nor.Territory	763,892	71,833	835,725	..	..	..	763,892	71,833	835,725
Fed.Territory	271,047	71,513	342,560	..	..	..	271,047	71,513	342,560
Total, C'wlth	918,090,197	298,141,465	1216231662	3,895,236	4,099,096	7,994,332	921,985,433	302,240,561	1224,225,994

The total of £1,216,231,662 for residents of Australia represents average net assets of £246 per head of population. The corresponding averages per head of population for the several States and Territories are as follows :—New South Wales, £251 ; Victoria, £282 ; Queensland, £193 ; South Australia, £279 ; Western Australia, £163 ; Tasmania, £181 ; Northern Territory, £176 ; and Federal Territory, £136. It should be noted that owing to the exclusion from the individual returns of interests in trust funds the figures here given somewhat underestimate the net assets per head of population. The inclusion of such funds with an allowance for those, the title to which is held outside the Commonwealth, would have the effect of increasing the average per head by from 15 to 20 per cent., and for the Commonwealth as a whole would probably give a result in the neighbourhood of £293. The average net assets per individual return recorded in respect of each State and Territory is shewn in the following table :—

Average Net Assets per Individual Return as at 30th June, 1915, recorded in respect of each State and Territory of Australia.

State or Territory.	Average Net Assets per Return recorded in respect of Residents of Australia.			Average Net Australian Assets per Return recorded in respect of Non-Residents.			Average Net Assets per Return for all Returns.		
	Males.	Females.	Persons.	Males.	Females.	Persons	Males.	Females.	Persons.
N.S.W. ..	691	398	592	4,096	3,350	3,692	695	405	596
Vic. ..	729	370	574	2,309	1,841	1,991	730	374	576
Q'land ..	524	295	446	1,383	657	978	525	295	446
S.A. ..	745	360	594	4,085	1,056	2,049	746	361	595
W.A. ..	498	342	457	2,408	1,841	2,159	501	346	460
Tas. ..	531	358	471	889	2,563	1,368	532	363	473
N.T. ..	592	835	607	..	..	..	592	835	607
F.T. ..	403	369	396	..	..	..	403	369	396
Aver. C'wlth	665	367	555	2,938	2,285	2,562	667	372	558

2. **According to size of net assets.**—(i.) *Grouping.* For the purpose of tabulating the results according to size of net assets, the particulars relative thereto were classified under 16 net assets groups, of which one comprised those cases in which the return shewed that the net assets were nil, or that there was an excess of liabilities over assets.

(ii.) *Net assets of persons resident in Australia.*—The succeeding table furnishes for each sex and for the sexes combined the number of cases recorded in respect of persons actually or usually resident in the Commonwealth in each of the groups mentioned in sub-section (i.) above. It also gives the proportion per cent. of total represented by each such group.

Assets* of Persons Resident in Australia—Number of Returns classified according to Net Assets.

Net Assets at 30th June, 1915.	Number of Returns.			Proportion per cent.		
	Males.	Females.	Total.	Males.	Females	Total.
				%	%	%
Debt and nil	249,693	110,036	359,729	18.0910	13.5556	16.4114
Under £100	533,315	392,146	925,461	38.6402	48.3095	42.2210
£100 and under £250	198,668	115,846	314,514	14.3941	14.2714	14.3486
£250 ,, £500	135,689	76,772	212,461	9.8311	9.4577	9.6928
£500 ,, £750	66,101	35,895	101,996	4.7892	4.4220	4.6532
£750 ,, £1,000	39,746	19,905	59,651	2.8797	2.4522	2.7214
£1,000 ,, £2,500	88,779	40,336	129,115	6.4323	4.9691	5.8904
£2,500 ,, £5,000	37,593	12,885	50,478	2.7237	1.5873	2.3029
£5,000 ,, £10,000	18,176	5,183	23,359	1.3169	.6385	1.0657
£10,000 ,, £15,000	5,313	1,362	6,675	.3849	.1678	.3045
£15,000 ,, £20,000	2,366	530	2,896	.1714	.0653	.1321
£20,000 ,, £25,000	1,283	279	1,562	.0930	.0344	.0713
£25,000 ,, £50,000	2,179	406	2,585	.1579	.0500	.1179
£50,000 ,, £75,000	641	81	722	.0464	.0100	.0329
£75,000 ,, £100,000	249	26	275	.0180	.0032	.0126
£100,000 and upwards ..	417	49	466	.0302	.0060	.0213
Total	1,380,208	811,737	2,191,945	100.0000	100.0000	100.0000
Total £500 and upwards	262,843	116,937	379,780	19.0436	14.4058	17.3262

*Exclusive of the value of (i.) interests in trust estates, (ii.) assurance and annuity policies, (iii.) prospective benefits from Friendly Societies and Trade Unions. These three items are included in bulk under "trust funds."

Of the returns received from resident males, 19 per cent. related to net assets of £500 and upwards, while about 14½ per cent. of those relative to resident females were in respect of net assets of £500 and upwards. For the sexes combined net assets of £500 and upwards were represented by somewhat less than 17½ per cent. of the returns.

The aggregate net assets represented by the returns shewn in the preceding table amounted to £1,216,231,662, of which £918,090,197 was recorded in respect of males, and £298,141,465 in respect of females. The average net assets per return for resident males was thus £665, as compared with an average of £367 per return for resident females, and an average for returns of residents of both sexes of £555. The aggregate net assets for each group and the proportion per cent. in each case is given in the following table in respect of persons actually or usually resident in Australia :—

Assets* of Persons Resident in Australia—Aggregate Net Assets disclosed by Returns.

Net Assets at 30th June, 1915.	Aggregate Amount.			Proportion per cent.		
	Males.	Females.	Total.	Males.	Females	Total.
	£	£	£	%	%	%
Under £100	17,119,415	10,975,234	28,094,649	1.8647	3.6812	2.3100
£100 and under £250	31,914,274	18,394,332	50,308,606	3.4761	6.1697	4.1364
£250 ,, £500	48,160,783	27,018,916	75,179,699	5.2458	9.0625	6.1814
£500 ,, £750	40,282,127	21,696,178	61,978,305	4.3876	7.2771	5.0959
£750 ,, £1,000	34,331,262	17,164,250	51,495,512	3.7394	5.7571	4.2340
£1,000 ,, £2,500	139,001,263	61,609,345	200,610,608	15.1403	20.6645	16.4944
£2,500 ,, £5,000	130,573,375	44,097,969	174,671,344	14.2223	14.7910	14.3617
£5,000 ,, £10,000	125,229,936	35,341,151	160,571,087	13.6403	11.8538	13.2023
£10,000 ,, £15,000	64,180,648	16,431,170	80,611,818	6.9907	5.5112	6.6280
£15,000 ,, £20,000	40,752,518	9,191,428	49,943,946	4.4388	3.0829	4.1065
£20,000 ,, £25,000	28,770,393	6,226,123	34,996,516	3.1337	2.0883	2.8775
£25,000 ,, £50,000	74,371,012	13,771,239	88,142,251	8.1006	4.6190	7.2472
£50,000 ,, £75,000	38,955,747	4,926,254	43,882,001	4.2431	1.6523	3.6080
£75,000 ,, £100,000	21,379,702	2,240,902	23,620,604	2.3287	.7516	1.9421
£100,000 and upwards ..	83,067,742	9,056,974	92,124,716	9.0479	3.0378	7.5746
Total	918,090,197	298,141,465	1,216,231,662	100.0000	100.0000	100.0000
Total £500 and upwards	820,895,725	241,752,983	1,062,648,708	89.4134	81.0866	87.3722

* Exclusive of the value of (i.) interests in trust estates, (ii.) assurance and annuity policies, (iii.) prospective benefits from Friendly Societies and Trade Unions. These three items are included in bulk under "trust funds."

It will be seen that net assets of £500 and upwards aggregated nearly 89½ per cent. in the case of male residents, about 81 per cent. in the case of female residents, and somewhat less than 87½ per cent. in the case of residents of both sexes. From these figures taken in conjunction with those relating to the number of returns, it appears that in the case of male residents 19 per cent. of the returns accounted for nearly 89½ per cent. of the net assets, that in the case of female residents 14½ per cent. of the returns accounted for 81 per cent. of the net assets, and that for the sexes combined somewhat less than 17½ per cent. of the returns accounted for somewhat less than 87½ per cent. of the net assets.

(iii.) *Australian net assets of non-residents.*—The next table furnishes in respect of non-residents the number and proportion of returns under each of the net asset groups :—

Assets of Persons non-resident in Australia—Number of Returns classified according to Net Assets.

Net Assets at 30th June, 1915	Number of Returns.			Proportion per cent.		
	Males.	Females.	Total.	Males.	Females	Total.
				%	%	%
Debt and nil	437	1,110	1,547	32.9563	61.8729	49.5833
Under £100	185	65	250	13.9517	3.6232	8.0128
£100 and under £250	121	63	184	9.1252	3.5117	5.8974
£250 ,, £500	133	62	195	10.0302	3.4560	6.2500
£500 ,, £750	89	45	134	6.7119	2.5084	4.2949
£750 ,, £1,000	68	27	95	5.1282	1.5050	3.0449
£1,000 ,, £2,500	92	121	213	6.9382	6.7447	6.8269
£2,500 ,, £5,000	66	108	174	4.9774	6.0200	5.5769
£5,000 ,, £10,000	54	106	160	4.0724	5.9086	5.1282
£10,000 ,, £15,000	24	33	57	1.8100	1.8395	1.8269
£15,000 ,, £20,000	13	16	29	.9804	.8919	.9295
£20,000 ,, £25,000	9	12	21	.6787	.6689	.6731
£25,000 ,, £50,000	17	16	33	1.2820	.8919	1.0577
£50,000 ,, £75,000	7	6	13	.5279	.3344	.4167
£75,000 ,, £100,000	3	1	4	.2262	.0557	.1282
£100,000 and upwards ..	8	3	11	.6033	.1672	.3526
Total	1,326	1,794	3,120	100.0000	100.0000	100.0000
Total £500 and upwards	450	494	944	33.9366	27.5362	30.2565

Of the returns received relative to non-resident males about 34 per cent. related to net assets of £500 and upwards. The corresponding proportion in the case of females was about 27½ per cent., and for the sexes combined 30¼ per cent.

The aggregate net assets represented by the returns specified in the preceding table were £7,994,332, of which £3,895,236 was accounted for on returns relating to males, and £4,099,096 on those relating to females. The average amount of net assets per return for non-resident males was thus £2938, as compared with £2285 per return in the case of females, and £2562 per return for the sexes combined.

The aggregate net assets in each group for each sex and the proportionate distribution over the several groups are shewn in the following table :—

Persons Non-resident in Australia—Aggregate Net Assets disclosed by Returns.

Net Assets at 30th June, 1915	Aggregate Amount.			Proportion per cent.		
	Males.	Females.	Total.	Males.	Females	Total.
	£	£	£	%	%	%
Under £100	5,761	2,901	8,662	.1479	.0708	.1084
£100 and under £250	19,752	10,390	30,142	.5071	.2535	.3770
£250 ,, £500	47,436	22,745	70,181	1.2178	.5549	.8779
£500 ,, £750	54,661	28,043	82,704	1.4033	.6841	1.0345
£750 ,, £1,000	58,068	22,865	80,933	1.4907	.5578	1.0124
£1,000 ,, £2,500	148,771	188,949	337,720	3.8193	4.6095	4.2245
£2,500 ,, £5,000	232,935	376,151	609,086	5.9800	9.1764	7.6190
£5,000 ,, £10,000	376,033	752,509	1,128,542	9.6537	18.3579	14.1168
£10,000 ,, £15,000	300,429	387,114	687,543	7.7127	9.4439	8.6004
£15,000 ,, £20,000	226,704	273,422	500,126	5.8200	6.6703	6.2560
£20,000 ,, £25,000	192,566	268,248	460,814	4.9436	6.5441	5.7642
£25,000 ,, £50,000	591,900	557,215	1,149,115	15.1955	13.5936	14.3741
£50,000 ,, £75,000	398,930	373,828	772,758	10.2415	9.1198	9.6663
£75,000 ,, £100,000	252,648	75,221	327,869	6.4861	1.8351	4.1013
£100,000 and upwards ..	988,642	759,495	1,748,137	25.3808	18.5283	21.8672
Total	3,895,236	4,099,096	7,994,332	100.0000	100.0000	100.0000
Total £500 and upwards	3,822,287	4,063,060	7,885,347	98.1272	99.1208	98.6367

(iv.) *Average net assets in each group.*—In the succeeding table the average net assets in each group are given, these averages having been obtained, as in the case of incomes, by totalling the net amounts on the several returns and dividing by the number of returns.

Average Net Assets per Return; Australia, 30th June, 1915.

Net Assets at 30th June, 1915	Average per Return for Australian Residents.			Average Australian Net Assets per Return for Non-residents.		
	Males.	Females.	Total.	Males.	Females	Total.
	£	£	£	£	£	£
Under £100	32	28	30	31	45	35
£100 and under £250	161	159	160	163	165	164
£250 ,, £500	355	352	354	357	367	360
£500 ,, £750	609	604	608	614	623	617
£750 ,, £1,000	864	862	863	854	847	852
£1,000 ,, £2,500	1,566	1,527	1,554	1,617	1,562	1,586
£2,500 ,, £5,000	3,473	3,422	3,460	3,529	3,483	3,500
£5,000 ,, £10,000	6,890	6,819	6,874	6,964	7,099	7,053
£10,000 ,, £15,000	12,080	12,064	12,077	12,518	11,731	12,062
£15,000 ,, £20,000	17,224	17,342	17,246	17,439	17,089	17,246
£20,000 ,, £25,000	22,424	22,316	22,405	21,396	22,354	21,944
£25,000 ,, £50,000	34,131	33,919	34,098	34,818	34,826	34,822
£50,000 ,, £75,000	60,773	60,818	60,778	56,990	62,305	59,443
£75,000 ,, £100,000	85,862	86,189	85,893	84,216	75,221	81,967
£100,000 and upwards ..	199,203	184,836	197,693	123,580	253,165	158,922
Average Assets—All Returns	665	367	555	2,938	2,285	2,562
£500 and upwards	3,123	2,067	2,798	8,494	8,225	8,353

3. **Debt, or negative wealth.**—A complete census of wealth includes "net assets," not only when they are *positive*, but also when they are *negative*, that is when the "net return" shews the individual to be "in debt." Suppose, for example, A owes B £3000, and is possessed of wealth to the value of £2000. If B *regarded* the debt a perfectly good one, he would shew himself as possessed, in addition to his other items of wealth, of £3000. But A would shew that he is "in debt", on the whole, £1000. Restricted to these facts the proper return of aggregate wealth would obviously be £3000 − £1000 = £2000, that is, the value of the negative wealth should be subtracted from the value of positive wealth. Thus any mortgagee credits himself only with the money lent on the mortgage, while the mortgagor virtually credits himself only with the value of the equity of redemption. It is clear from this that where the net results of the assets of any group or groups of persons are negative, they should strictly be deducted from the net results of the group or groups of persons whose assets are positive.

Since the returns do not permit the analysis of individual cases, this may occasionally lead to some uncertainty as to the grouping according to the amount of wealth possessed. In general, however, such grouping will be substantially correct.

With a view to ascertaining the extent and the nature of the error involved in the omission of the debts shewn on the returns relating to negative wealth, a special tabulation of 5703 cards, shewing debt, was made from a parcel of 51,514 which had been classed as "Nil and debt." The returns in question related to several counties of the State of Victoria, and were taken from a total of 244,772 returns (including the 51,514 mentioned above), which gave a total net assets of £122,489,039 when no allowance was made for the "debt" items contained in the "nil and debt" groups. The aggregate amount of debt so tabulated was £289,785, or say $2\frac{1}{3}$ per thousand of the total covered by the class of cards from which the sample was drawn. In view of the relative smallness of the amount and of the evidence deduced in the succeeding section relative to the possible incompleteness of the War Census, it was

not deemed advisable to carry the investigation further, or to make any specific allowance in the aggregate for such results, more particularly as the evidence furnished by a close scrutiny of many of the so recorded " nil " cards indicated that further inquiry would probably disclose small net assets.

For the purpose of analysing the progression in the returns of debts, and also of small net assets, and for the further purpose of furnishing a suitable basis for the estimation and analysis of material lying below the range of probate data, the following tables have been compiled from the returns for one of the Victorian districts :—

Frequency of the Possession of small amounts of Wealth, based upon 25,932 Cases in Victoria, Australia (Total Population embraced about 77,350).*

Debts.				Range of Debts or Assets.	Assets.			
Observed Numbers.			Average Value per Person.†		Average Value per Person.†	Observed Numbers.		
Males.	Females	Persons.				Males.	Females.	Persons.
			£	£	£			
267	123	390	3.74	0-10	3.74	3,635	3,658	7,293
109	16	125	14.10	10-20	14.10	908	1,120	2,028
57	10	67	24.85	20-30	24.85	782	790	1,572
28	3	31	34.86	30-40	34.86	549	481	1,030
20	5	25	44.89	40-50	44.89	448	407	855
15	2	17	54.89	50-60	54.89	467	385	852
13	1	14	64.89	60-70	64.89	297	241	538
7	1	8	74.89	70-80	74.89	295	214	509
4	1	5	84.89	80-90	84.89	237	200	437
5	0	5	94.90	90-100	94.90	197	155	352
525	162	687	23.25	Totals	23.25	7,815	7,651	15,466
40	4	44	?	100-250	156.38	2,012	1,669	3,681
10	2	12	?	250-500	353.50	1,292	1,016	2,308
6	1	7	?	Over-500	2217.8	2,269	1,458	3,727
581	169	750	?	AllAssets	405.77	13,388	11,794	25,182

* Viz., males, 37,420 ; Females, 39,930. † Calculated from frequency curve.

Range of Assets.	Average Value in Range per Individual.			Ratio of Number of Males to Persons.	Observed Numbers.		
	Males.	Females	Persons		Males.	Females	Persons.
£	£	£	£				
0- 100 ..	24.17	21.78	23.25	0.5053	7,815	7,651	15,466
100- 250 ..	157.07	155.55	156.38	0.5466	2,012	1,669	3,681
250- 500 ..	356.56	349.60	353.50	0.5598	1,292	1,016	2,308
500- 750 ..	607.99	595.82	602.34	0.5356	586	508	1,094
750- 1000 ..	864.24	862.18	863.39	0.5895	372	259	631
1000- 2500 ..	1568.4	1507.7	1543.6	0.5910	734	508	1,242
2500- 5000 ..	3536.8	3349.9	3482.5	0.7095	320	131	451
5000-10000 ..	7149.9	6707.1	7059.4	0.7955	175	45	220
Over 10000 ..	25744.3	15910.9	24970.9	0.9123	82	7	89
Totals ..	544.57	248.21	405.77	0.5316	13,388	11,794	25,182

Aggregate Assets of Persons Possessing Wealth, between various ranges thereof.

DEBTS.					ASSETS.			
Males.	Females.	Persons.	Proportion of Total for Males.	Range of Debts or Assets.	Proportion of Total held by Males.	Males.	Females.	Persons.
£	£	£		£ £		£	£	£
999	460	1,459	.685	0- 10	0.4984	13,595	13,681	27,276
1,537	226	1,763	.872	10- 20	0.4477	12,803	15,792	28,595
1,416	249	1,665	.851	20- 30	0.4974	19,433	19,632	39,065
976	105	1,081	.903	30- 40	0.5330	19,138	16,768	35,906
898	224	1,122	.800	40- 50	0.5240	20,111	18,270	38,381
823	110	933	.882	50- 60	0.5481	25,634	21,133	46,767
843	65	908	.928	60- 70	0.5520	19,272	15,638	34,910
524	75	599	.875	70- 80	0.5796	22,093	16,026	38,119
340	85	425	.800	80- 90	0.5423	20,119	16,978	37,097
474	..	474	1.000	90-100	0.5596	18,695	14,710	.33,405
8,830	1,599	10,429	.847	Totals	0.5310	190,893	168,628	359,521
?	?	?		100-250	0.5490	316,029	259,618	575,647
?	?	?		250-500	0,5646	460,676	355,192	815,868
?	?	?		Over 500	0.7468	6,323,056	2,143,927	8,466,983
581*	169*	750*	0.775†	All Assets	0.7135	7,290,654	2,927,365	10,218,019
				£ £		£	£	£
				0– 100	0.5310	190,893	168,628	359,521
				100– 250	0.5490	316.029	259,618	575,647
				250– 500	0.5646	460,676	355,192	815,868
				500– 750	0.5407	356.280	302,677	658,957
				750– 1000	0.5901	321,497	223,305	544,802
				1000– 2500	0.6005	1,151,223	765,907	1,917,130
				2500– 5000	0.7206	1,131,781	438,844	1,570,625
				5000–10000	0.8057	1,251,240	301,818	1,553,058
				Over10,000	0.9499	2,111,035	111,376	2,222,411
				All Assets	0.7135	7,290,654	2,927,365	10,218,019

* Numbers only. † Ratio of numbers only; amounts not known.

4. **Wealth unrepresented by material values.**—Returns of wealth are subject to certain limitations which it is important to notice. Book debts, for example, may be under or over estimated. Consols, inscribed stock, debenture, and bank-notes *intrinsically* are not wealth, but depend upon the aggregate wealth—and its security—of the community issuing them.

Suppose, for example, that a national loan of £500,000,000 were held wholly by the citizens of any nation, the private wealth would include this amount—or its market equivalent—while a statement of the *national wealth*, that is, of the people in their corporate as well as in their individual capacity—the two being combined—would contain a debit item of approximately the same amount. It is quite usual for estimates of "national wealth" to represent merely the aggregates of private wealth, plus the value of works nationally owned; such estimates therefore may be very misleading, for the reason above indicated. They must not be regarded as the realised wealth of the nation in its entirety.

5. **Possible incompleteness of the War Census.**—A Census hurriedly taken under war conditions cannot compare for completeness and accuracy with one taken by a large number of systematically organised " Collectors," who see that each responsible person makes the necessary reply to the questions asked. In the case of the War Census the duty of making returns was perforce cast upon each individual. It becomes necessary therefore to gauge the measure of the completeness of the result. This can be roughly done by ascertaining the numbers in each State who failed to make a return, and comparing them with the numbers of all under the age of 21, many of which would presumably have no return to make. It may be noted on the one hand that in the case of females a large proportion of adults will have no returns to make since they have neither wealth nor income, and on the other hand that juniors will frequently have to make returns for the reason that they have one or both. The result of the comparison referred to is as follows :—

Table shewing the Analysis of the Number of Returns for the War Census.

Subject.	—	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	C'wlth.
Population as at 30th Sept, 1915	Males	960,149	701,150	370,503	218,766	176,237	101,026	2,527,831
	Females	913,817	722,268	321,260	225,080	146,899	96,874	2,426,198
	Persons	1,873,966	1,423,418	691,763	443,846	323,136	197,900	4,954,029
Under Age 21 (Ratio)	Males	.429401	.433977	.428819	.430158	.365831	.472195	.427925
	Females	.455473	.423846	.491660	.441025	.467668	.475081	.451037
	Persons	.442114	.428845	.458003	.435669	.412126	.473607	.439246
Under Age 21 (Numbers)	Males	412,289	304,283	158,879	94,104	64,473	47,704	1,081,732
	Females	416,219	306,144	157,951	99,266	68,700	46,023	1,094,303
	Persons	828,508	610,427	316,830	193,370	133,173	93,727	2,176,035
Not Accounted For*	Males	435,430	304,250	173,387	91,498	91,705	51,353	1,147,623
	Females	645,114	419,322	219,018	144,285	116,276	70,446	1,614,461
	Persons	1,080,544	723,572	392,405	235,783	207,981	121,799	2,762,084
Numbers not accounted, less those under age 21	Males	23,141	— 33	14,508	— 2,606	27,232	3,649	65,891
	Females	228,895	113,178	61,067	45,019	47,576	24,423	520,158
	Persons	252,036	113,145	75,575	42,413	74,808	28,072	586,049
Number of Pensioners.	Males	18,727	14,029	6,878	4,109	2,482	2,231	48,456
	Females	22,315	20,390	7,476	6,420	2,606	3,646	62,853
	Persons	41,042	34,419	14,354	10,529	5,088	5,877	111,309

* That is, the total population less the number making returns.

It is not improbable that practically all persons whose estates are of greater value than say £250, or whose incomes are above say £200, are recorded. It follows, therefore, that the correction to be made—if any—must not be a mere proportion[1] based on the assumption that *all* adults should have made a return, but must be on the supposition that the defect of numbers represents small incomes and small amounts.

These defects are serious in the case of Western Australia. The ratio to total males of the amount by which males " not accounted for" exceed males under 21 for the several States and the Commonwealth are as in the upper line of the following results :—

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	C'wlth.
.02410	—.00005	.03916	—.01191	.15452	.03612	.02607
.04410	—.00008	.07360	—.02048	.32215	.07346	.04774

1 If all adults only should have made returns, and the defect were proportional throughout, the factors for correction would have been—say for New South Wales — 435,430/412,289, 304,250/304,283, etc. It is obvious, however, that the factor ought, in all cases, to be *greater* than unity, and it is obvious also that in the case of females it would give excessive results.

The lower line denotes the proportion which the male "excess" referred to bears to the number of males making returns.

Regarding the point that *all* adults might be expected to have made a return, it may be noted on the one hand that there were on 30th June, 1915, 48,456 male, and 62,853 female pensioners, who probably can be taken as possessing neither property nor income; and on the other hand, account should also be taken of the fact that all persons of age 18 and upwards were required to make returns, and also juniors possessed of either. Again, old persons, not pensioners, living with their relatives, would often belong to the class possessing neither property nor income. The numbers of male, female and total pensioners in each State are shewn in the table on page 36.

No exact estimate can be made of the defects in the returns either in respect of numbers or amounts represented, but what has been adduced shews that the whole measure of the uncertainty is negligible as compared with that due to unavoidable limitations in the estimates of values, and perhaps also as to the amounts of income.

Under these circumstances it has been considered advisable not to attempt any correction of the results obtained by tabulation of the returns received. It may be noted that in many cases returns, often of small amounts, were received in respect of children under 18, the particulars being furnished sometimes on a parent's card, and sometimes on a separate card.

CHAPTER IV.—SPECIAL CLASSES OF ASSETS.

1. **General.**—As indicated in the preceding chapter, the principal tabulations of the Wealth Census data were based upon (*a*) States of residence, (*b*) Grades of ownership, and (*c*) Size of net assets. For certain purposes, it was deemed desirable to tabulate the gross amounts of assets shewn under some of the items, but owing to the expense that would be involved, a complete tabulation of all the items was not undertaken. The items specially tabulated were (*a*) Cash in hand, (*b*) Shares and debentures in companies, (*c*) Land-values.

2. **Cash in hand.**—Various estimates have been made from time to time of the amount of coin in circulation in Australia, but the figures quoted have differed considerably. The average amount held by the banks in each quarter is published regularly, but the amount in the hands of the public has proved difficult to determine with any degree of accuracy.

In 1892 the manager of one of the Sydney banks estimated the amount of coin in private hands in New South Wales at £725,000, or 12s. 5d. per head. At the same date the amount of bank notes in circulation in New South Wales was approximately £1,500,000, making on the basis of the coin estimate quoted a total circulation in the hands of the public of £2,225,000, or £1 18s. 1d. per head of population.

In 1906 the Deputy-master of the Perth branch of the Royal Mint conducted an inquiry concerning the amount of coin in circulation in the hands of the public in Australia, and as a result gave an estimate of £4,200,000, or £1 0s. 8d. per head. According to this estimate the gold coin in circulation amounted to £3,000,000, while the silver and copper coin amounted to £1,200,000. At the same date the amount of bank notes and of Queensland Treasury notes in the hands of the public was approximately £3,900,000. This would give a total circulation for Australia of £8,100,000, or £1 19s. 11d. per head of population, of which silver and copper coin represented 5s. 11d. per head.

According to the estimate of the Commonwealth Treasury, it appears that at the 28th June, 1915, the amount of Australian notes in the hands of the public was £8,626,508, or £1 14s. 10d. per head of population. If it be assumed that at that date there was no gold in circulation, and that the silver and copper coin in the hands of the public was on the same basis as in the 1906 Mint estimate, the amount of circulation in the hands of the public works out at £2 0s. 9d. per head of population, as compared with an estimate for Australia of £1 19s. 11d. in 1906, and an estimate for New South Wales of £1 18s. 1d. in 1892.

In view of these estimates it would appear that the figures for "Cash in hand" furnished on the Wealth Census Cards were considerably below the truth, even when allowance is made for the fact that the returns are for part of the population only. The tabulated results were as follows :—

Aggregate amount of "Cash in Hand" as at 30th June, 1915, shewn on War Census "Wealth and Income" Cards.

States and Territories.	"Cash in Hand" as at 30th June, 1915.								
	Aggregate Amount.	Per head of Total Population.			Per Return furnished.		
	£	£	s.	d.	£	s.	d.
New South Wales ..	1,794,270	0	19	2	2	4	2
Victoria	1,889,027	1	6	6	2	11	10
Queensland	934,717	1	7	1	3	0	4
South Australia	626,316	1	8	7	2	18	5
Western Australia ..	457,646	1	8	5	3	17	9
Tasmania	244,354	1	4	8	3	2	1
Northern Territory ..	9,985	2	4	11	7	2	10
Federal Territory ..	2,828	1	1	11	3	4	10
Commonwealth ..	5,959,143	1	4	1	2	12	8

There is, as might be expected, an appreciable difference between the average of £1 4s. 1d. per head of population shewn for the Commonwealth in the above table and that of £2 0s. 9d. deduced for the same date on the basis of estimates of circulation of Australian notes and of silver and copper coin, and, as before stated, there is little doubt that the War Census result is an understatement of the amount. Apart from the fact that this average is obtained by attributing a *partial* return to a *total population*, one of the reasons for this is probably the fact that the Census was taken in the middle of September, 1915, and that the particulars asked for were required to be stated as at 30th June, 1915. Except in the case of establishments keeping books of account, there are probably few instances in which a correct statement of cash in hand could be furnished after a lapse of ten weeks. Another reason for a shortage in the aggregate record of "Cash in hand" is the fact that many persons, whose possessions were only "what they stood up in," failed to furnish a return. As indicated in Chapter II. (p. 23), returns were received from 1,380,208 males, and 811,737 females, who were resident in the Commonwealth at the date of the Census. There were thus approximately 1,147,000 males, and 1,614,000 females resident in Australia from whom no returns were received. A very large proportion of these were children, but even taking this fact into account, it is probable that the "Cash in hand" of these 2,761,000 unrecorded persons would aggregate a considerable sum. To make an average of £2 0s. 9d. per head, these 2,761,000 unrecorded persons would have to possess an average of £1 9s. 8d. each. Seeing that about 1,600,000 of these were children under 15, who would probably possess an average of less than two shillings each, this is an improbably large amount.

3. **Shares and debentures in companies.**—As indicated in Chapter III. (p. 29), the tabulation of data concerning shares and debentures in companies was undertaken mainly for the purpose of enabling an appropriate allowance to be made in the wealth returns to avoid the inclusion of company assets twice over. The totals obtained were as follows :—

Values of " Shares and Debentures in Companies" as at 30th June, 1915, recorded on War Census " Wealth and Income" Cards.

States and Territories.	Value of "Shares and Debentures in Companies" as at 30th June, 1915.			
	Aggregate Amount.	Per Head of Total Population.		
	£	£	s.	d.
New South Wales	78,014,876	41	14	11
Victoria	54,510,331	38	4	4
Queensland	17,419,924	25	5	2
South Australia	18,164,163	41	9	0
Western Australia	3,212,700	9	19	3
Tasmania	4,573,790	23	1	0
Northern Territory	31,669	7	2	5
Federal Territory	8,420	3	5	1
Commonwealth	175,935,873	35	10	8

For the purpose of avoiding the possibility of duplication, a special series of inquiries was made from companies registered in Australia. From the replies received to these it appears that the net assets of such companies, without making any allowance for liabilities to shareholders and debenture holders, was £286,248,290 as at 30th June, 1915. If it be assumed that the " Shares and debentures in companies" held in the Commonwealth on 30th June, 1915, were all in connection with companies registered in Australia, it would appear that the amount so held represented about 61½ per cent. of the total value of the shares and debentures of such companies, the balance being presumably held by absentees.

In addition, the net assets in Australia of companies registered elsewhere aggregated £34,323,448.

4. **Land values.**—The total number of owners of freehold land recorded at the War Census was 718,569, of whom 683,849 were individuals and 34,720 represented Partnerships, Trust Estates, Companies and Institutions. Of the individual owners, 460,646 were males, and 223,203 were females. The male owners represented 18.2 per cent. of the male population, while the female owners represented 9.2 per cent. of the female population. The total improved value recorded was £983,880,323, averaging £1,369 per owner. The corresponding unimproved value recorded was £455,876,104, or 46⅓ per cent. of the improved value, and the average unimproved value per owner was £634.

Particulars concerning the unimproved values of freehold estates held by residents of the several States and Territories are given in the following table:—

Number and Unimproved Value of Freehold Estates Recorded in Respect of States, Territories, and Commonwealth, as at 30th June, 1915.

Value.	N. S. Wales.	Victoria.	Queensland.	S. Australia.	W. Australia.	Tasmania.	Nth. Terr.	Fed. Terr.	C'wealth.
NUMBER OF ESTATES.									
Less than £100	91,619	77,516	45,923	27,896	22,810	9,743	62	46	275,615
£100 and under £200	47,661	47,029	20,242	12,932	8,753	5,276	35	28	141,956
£200 „ £300	23,637	23,681	9,907	6,973	4,110	2,909	17	14	71,248
£300 „ £400	13,908	14,037	6,266	3,931	2,451	1,837	9	11	42,450
£400 „ £500	9,316	9,575	4,297	2,719	1,748	1,206	8	4	28,873
£500 „ £600	6,837	6,811	2,996	2,033	1,513	900	4	5	21,099
£600 „ £700	5,582	5,677	2,452	1,609	928	665	3	2	16,918
£700 „ £800	4,242	4,327	1,687	1,186	717	556	3	3	12,721
£800 „ £900	3,650	3,632	1,352	1,086	578	432	3	3	10,736
£900 „ £1,000	2,884	3,230	999	808	373	302	1	2	8,599
£1,000 „ £3,000	21,943	23,687	6,035	7,169	2,521	2,184	6	15	63,560
£3,000 „ £5,000	4,118	5,149	883	1,714	369	378	..	1	12,612
£5,000 and over	4,994	4,253	900	1,154	447	431	..	3	12,182
Total	240,391	228,604	103,939	71,210	47,318	26,819	151	137	718,569
UNIMPROVED VALUE OF ESTATES.									
	£	£	£	£	£	£	£	£	£
Less than £100	4,337,316	3,546,048	2,092,179	1,234,897	1,012,271	421,562	2,651	1,775	12,648,699
£100 and under £200	6,324,675	6,322,866	2,667,520	1,701,135	1,137,514	693,045	4,301	3,674	18,854,730
£200 „ £300	5,508,808	5,532,790	2,288,420	1,611,068	952,821	666,960	3,996	3,243	16,568,106
£300 „ £400	4,627,007	4,695,661	2,071,789	1,299,756	816,174	602,427	2,845	3,780	14,119,439
£400 „ £500	4,034,588	4,178,279	1,848,656	1,172,445	756,239	513,695	3,390	1,740	12,509,032
£500 „ £600	3,618,568	3,644,132	1,577,771	1,074,515	793,509	468,278	2,075	2,540	11,181,388
£600 „ £700	3,531,422	3,607,092	1,541,066	1,014,037	585,718	418,172	1,850	1,240	10,700,597
£700 „ £800	3,123,471	3,188,301	1,231,854	870,207	528,526	404,917	2,200	2,235	9,351,711
£800 „ £900	3,025,231	3,025,587	1,117,134	904,209	480,839	358,081	2,450	2,453	8,915,984
£900 „ £1,000	2,691,221	3,036,913	931,322	755,583	348,912	280,858	900	1,885	8,047,594
£1,000 „ £3,000	36,358,098	39,991,285	9,409,161	12,401,708	3,930,839	3,565,942	8,240	21,090	105,686,363
£3,000 „ £5,000	15,539,033	19,576,524	3,322,677	6,408,339	1,372,988	1,400,251	..	3,819	47,623,631
£5,000 and over	79,626,026	61,811,358	12,048,732	14,660,208	6,272,030	5,227,926	..	22,550	179,668,830
Total	172,345,464	162,156,836	42,148,281	45,108,107	18,988,380	15,022,114	34,898	72,024	455,876,104

NOTE.—The allocation to States and Territories in this return relates merely to the *domicile* of the owner or the owner's representative. Particulars relative to the situation of the property itself are not available.

The succeeding table gives, for the Commonwealth as a whole, a distribution of the number and unimproved values of freehold estates according to grade of ownership :—

Number and Unimproved Value of Freehold Estates Recorded in the Commonwealth as at 30th June, 1915.

Value.	Individuals.		Partnerships.	Trust Estates.	Companies.	Institutions.	Total.
	Males.	Females.					
NUMBER OF ESTATES.							
Less than £100	172,795	96,999	611	2,507	303	2,400	275,615
£100 and under £200	88,057	50,022	566	2,163	234	914	141,956
£200 „ £300	44,656	23,919	421	1,554	162	536	71,248
£300 „ £400	27,024	13,325	373	1,284	105	339	42,450
£400 „ £500	18,772	8,506	292	983	105	215	28,873
£500 „ £600	14,104	5,575	311	823	101	185	21,099
£600 „ £700	11,508	4,235	244	731	73	127	16,918
£700 „ £800	8,701	3,024	218	617	61	100	12,721
£800 „ £900	7,333	2,536	184	514	65	104	10,736
£900 „ £1,000	5,987	1,872	173	439	55	73	8,599
£1,000 „ £3,000	45,502	10,671	1,813	4,272	698	604	63,560
£3,000 „ £5,000	9,021	1,456	636	1,102	260	137	12,612
£5,000 and over	7,186	1,063	926	1,867	889	251	12,182
Total	460,646	223,203	6,768	18,856	3,111	5,985	718,569
UNIMPROVED VALUE OF ESTATES.							
	£	£	£	£	£	£	£
Less than £100	7,961,410	4,445,852	31,274	121,824	12,446	75,893	12,648,699
£100 and under £200	11,714,478	6,616,734	78,031	297,548	31,520	116,419	18,854,730
£200 „ £300	10,373,802	5,561,847	98,233	371,638	38,560	124,026	16,568,106
£300 „ £400	8,997,433	4,419,131	123,637	432,837	34,687	111,714	14 119,439
£400 „ £500	8,139,935	3,673,337	128,069	430,040	45,631	92,020	12,509,032
£500 „ £600	7,473,570	2,952,061	164,674	441,344	53,684	96,055	11,181,388
£600 „ £700	7,269,507	2,684,884	154,477	465,225	46,787	79,717	10,700,597
£700 „ £800	6,399,643	2,226,350	160,446	446,608	45,353	73,311	9,351,711
£800 „ £900	6,083,823	2,107,803	154,257	430,037	54,211	85,853	8,915,984
£900 „ £1,000	5,608,786	1,742,900	162,230	413,891	51,783	68,004	8,047,594
£1,000 „ £3,000	75,833,949	16,912,896	3,226,288	7,451,621	1,253,839	1,007,770	105,686,363
£3,000 „ £5,000	33,981,863	5,450,034	2,429,995	4,218,066	1,028,389	515,284	47,623,631
£5,000 and over	82,167,216	10,983,029	14,843,806	34,014,783	31,118,343	6,541,653	179,668,830
Total	272,005,415	69,776,858	21,755,417	49,535,462	33,815,233	8,987,719	455,876,104

A comparison of the figures furnished by the War Census tabulation and those given by the Commonwealth Land Tax assessments indicates that there is not any marked deviation between the two sets of results in so far as estates having an unimproved value of £5000 and upwards is concerned. The Commonwealth taxation returns are not, of course, on all fours with the War Census returns, owing in part to the procedure which must be followed in accumulating the landed property of individual landholders for taxation purposes, and in part to the fact that the taxation returns refer to taxable Crown leases as well as to freehold properties. As an example of the effect of the principle of accumulation, the case may be cited of a landholder who has a freehold of £4000 unimproved value in his own right, and is to the extent of £2000 unimproved value interested as a shareholder in a company. For taxation purposes his estate would be classed as exceeding £5000, while in the War Census returns he would be tabulated as under £5000.

The total unimproved value of estates of £5000 unimproved value and upwards was shewn by the War Census returns as £179,668,830. The unimproved value as returned by owners for Commonwealth taxation purposes for the year 1914-15 was £189,652,780, while the value ascertained by the Taxation Department was £201,363,845. In view of the facts mentioned above, these latter must be considered as fairly closely in accord with the War Census results.

5. **Relation between Improved and Unimproved Values.**—In compiling particulars relative to unimproved values, the corresponding improved values were tabulated in detail under each category, thus facilitating a comprehensive review of the relation between the improved and unimproved values according to States and Territories, and also according to size of holdings.

Particulars in respect of the several States and Territories in which the owners were domiciled is furnished in the following table :—

Freehold Estates as at 30th June, 1915, recorded at the War Census.

State or Territory of Domicile of Owner.	Number of Owners.	Aggregate Values.		Average Per Owner.		Ratio per cent. of Unimproved to Improved Aggregate Value.
		Improved Value.	Unimproved Value.	Improved Value.	Unimproved Value.	
		£	£	£	£	%
N. S. Wales ..	240,391	383,765,206	172,345,464	1,596	717	44.91
Victoria ..	228,604	340,924,702	162,156,836	1,491	709	47.56
Queensland ..	103,939	87,573,277	42,148,281	843	406	48.13
S. Australia ..	71,210	94,650,830	45,108,107	1,329	633	47.66
W. Australia ..	47,318	46,826,693	18,988,380	990	401	40.55
Tasmania ..	26,819	29,889,149	15,022,114	1,114	560	50.26
N. Territory ..	151	83,916	34,898	556	231	41.59
Fed. Territory	137	166,550	72,024	1,216	526	43.24
Commonwealth	718,569	983,880,323	455,876,104	1,369	634	46.33

A corresponding result for the Commonwealth as a whole, tabulated according to unimproved values, is given in the next table :—

Freehold Estates in the Commonwealth as at 30th June, 1915, recorded at the War Census.

Unimproved Value.	Number of Owners.	Aggregate Values.		Average per Owner.		Ratio per cent. of Unimproved to Improved Capital Value.	
		Improved Value.	Unimproved Value.	Improved Value.	Unimproved Value.	From Data.	Smoothed.
		£	£	£	£	%	%
Less than £100	275,615	46,028,242	12,648,699	167	46	27.48	27.48
£100 and under £200	141,956	56,621,790	18,854,730	399	133	33.30	33.30
£200 ,, £300	71,248	45,656,504	16,568,106	641	233	36.29	36.29
£300 ,, £400	42,450	36,614,269	14,119,439	863	333	38.56	38.56
£400 ,, £500	28,873	30,815,075	12,509,032	1,067	433	40.59	40.30
£500 ,, £600	21,099	27,581,063	11,181,388	1,307	530	40.54	42.00
£600 ,, £700	16,918	24,831,873	10,700,597	1,468	632	43.09	43.09
£700 ,, £800	12,721	21,257,867	9,351,711	1,671	735	43.99	43.89
£800 ,, £900	10,736	19,853,338	8,915,984	1,849	830	44.91	44.59
£900 ,, £1,000	8,599	17,863,894	8,047,594	2,077	936	45.05	45.25
£1,000 ,, £3,000	63,560	217,190,485	105,686,363	3,417	1,663	48.66	48.66
£3,000 ,, £5,000	12,612	91,109,808	47,623,631	7,224	3,776	52.27	52.27
£5,000 and over ..	12,182	348,456,115	179,668,830	28,604	14,749	51.56	..
Totals, & Aver. over all ..	718,569	983,880,323	455,876,104	1,369	634	46.33	46.33

The above results for the aggregates, both of the improved and unimproved values, may be represented from the second line onward by curves of the exponential type. Making the unit £1000, the "improved values" for the groups £100 to £1000 are given by

$$(1)\ldots\ldots V_n = 71975 \,.\, m \,.\, m' \,.\, m'' \,.\, m''' \ldots\ldots \text{etc.}$$

in which m has the following values for the successive groups, viz., 0.790; 0.790 + 1 (0.017); 0.790+2 (0.017); 0.790+3 (0.017); etc., the continued product giving the values shewn hereunder, the first value being 71975.

The "unimproved values" between the same limits are given by the expression

$$(2)\ldots\ldots V'_n = 199742\ (0.90116)^n.$$

where n has the values 0, 1, 2, 3, etc., for the successive groups.

For the purpose of comparing the formula and the data, it will suffice to express the results in millions sterling. The two results are :—

Improved Values.

Range of Values* ..	0—100 †	100–200.	200–300.	300–400.	400–500.	500–600.	600–700.	700–800.	800–900.	900–1000.
Aggregate (data) ..	46.03	56.62	45.66	36.61	30.82	27.58	24.88	21.26	19.85	17.86
Aggregate (formula) ..	71.97	56.86	45.89	37.81	31.80	27.28	23.87	21.29	19.36	17.92

Unimproved Values.

Aggregate (data) ..	12.65	18.86	16.57	14.12	12.51	11.18	10.70	9.35	8.92	8.05
Aggregate (formula) ..	19.97	18.00	16.22	14.62	13.17	11.87	10.70	9.64	8.48	7.59

* Unimproved values. † These results are uncertain owing to the incompleteness of the data.

The distribution is thus seen to be very regular.[1]

1 The ratios determined from these values, however, do not agree very well with the smoothed values of the ratio of the "unimproved" to the "improved" capital value.

The increase in the ratio of unimproved to improved values indicates that on the average, improvements represent a much larger proportion of the total value in the case of small properties than in the case of those of greater value. The corresponding ratios for the several States and Territories are shewn hereunder :—

Ratio per cent. of Unimproved to Improved Capital Value as at 30th June, 1915, recorded at the War Census.

Unimproved Value.	N.S.W.	Vic.	Q'ld.	S.A.	W.A.	Tas.	N.T.	F.T.	Cwlth
	%	%	%	%	%	%	%	%	%
Less than £100	30.30	27.73	28.54	18.67	28.19	30.56	38.80	30.18	27.48
£100 and under £200	33.68	33.29	36.86	27.91	32.28	35.07	37.97	40.91	33.30
£200 ,, £300	35.66	35.73	41.45	33.47	35.99	38.68	42.80	44.45	36.29
£300 ,, £400	37.10	37.73	44.98	37.74	37.06	42.19	44.11	31.95	38.56
£400 ,, £500	38.53	39.82	47.77	41.01	38.82	44.12	41.34	46.03	40.59
£500 ,, £600	38.82	40.60	49.26	36.57	39.19	42.24	51.62	41.44	40.54
£600 ,, £700	40.63	42.38	52.14	44.34	40.83	44.32	40.22	41.96	43.09
£700 ,, £800	41.13	43.76	51.90	46.84	41.88	46.34	55.70	34.04	43.99
£800 ,, £900	41.53	45.05	54.64	48.20	41.41	47.30	32.24	47.38	44.91
£900 ,, £1,000 ..	42.49	44.89	50.93	49.01	42.23	49.99	90.00	34.64	45.05
£1,000 ,, £3,000 ..	45.05	49.69	54.35	54.95	43.63	50.70	40.00	44.64	48.66
£3,000 ,, £5,000 ..	46.89	54.97	58.14	58.03	43.73	57.21	..	61.91	52.27
£5,000 and over	50.01	53.12	51.10	54.89	44.62	61.56	..	45.93	51.56
All Values	44.91	47.56	48.13	47.66	40.55	50.26	41.59	43.24	46.33

6. **The distribution of freehold estate.**—The numbers of persons possessing estates the unimproved values of which were between assigned limits, are given in the table on p. 43. In a total of 1,000,000 these may be fairly well represented by the expression :—

$$(3)\ldots\ldots N_n = 379000.\ r\ .\ r'\ .\ r''\ .\ r'''\ .\ \text{etc.}$$

where r has the successive values 0.490 ; 0.490 + 1 (0.052) ; 0.490 + 2 (0.052) ; 0.490 + 3 (0.052) ; etc. ; the continued product being as shewn hereunder, the first value being 379000. This expression does not hold for the higher ranges, however.

Range Unimproved Values £	0-100	100-200.	200-300.	300-400.	400-500.	500-600.	600-700.	700-800.	800-900.	900-1000.
No. of Persons (unit 100) by data..	3836	1976	992	591	402	294	235	177	149	120
by formula	3790	1857	1007	598	386	270	202	162	138	125

The actual number of cases was 718569, but the figures above express the distribution of 1,000,000 cases.

The regularity of the distributions of persons, and of "unimproved" and "improved" values indicates that they can be used for purposes of prediction with some degree of confidence.

7. **Live Stock.** (i.) *General.*—In addition to a statement of the value of assets, each person was required to furnish a return of the number of live stock (if any), possessed by him, and particulars in respect of horses, cattle, and sheep were tabulated. Apart from other uses, the classification of the horses and cattle into several categories furnishes important information which is not readily obtainable elsewhere. Owing to the facts that the War Census returns relate geographically to the domicile

of the owners of the live stock, and not to the domicile of the live stock, and that much stock depastured, for example, in Queensland is owned by residents of Melbourne or Sydney, the figures obtained on tabulation for the several States do not, of course, accord at all closely with the returns of live stock collected annually in respect of those States. The War Census aggregates of horses, cattle and sheep for the whole of Australia are, however, in fair agreement with the aggregates obtained from the annual returns. It is thus evident that no useful purpose would be served by publishing the figures for a smaller area than the Commonwealth as a whole.

(ii.) *Horses.*—The number and classes of horses recorded at the War Census were as follows :—

Horses recorded in the Commonwealth at the War Census of September, 1915.

Grade.	Stallions.	Geldings.	Mares.	Foals (under 2 years).	Total.
Draught	19,546	478,811	462,820	151,049	1,113,226
Light Harness	23,119	348,765	322,303	83,491	777,678
Saddle	19,546	235,907	270,066	94,244	619,763
Total	62,211	1,064,483	1,055,189	328,784	2,510,667

The returns collected annually by the States do not relate to the same dates, some being collected as at 30th June, others as at 31st December, and others, again, as at 31st March. The total usually given as the number of horses in Australia for 1914 based on these State returns is 2,521,272, while the corresponding total for 1915 is 2,377,920. The former of these is approximately applicable to about the end of January, 1915, and the latter to the same point of time in 1916. It will be seen that the War Census total of 2,510,667 is in close accord with these figures.

(iii.) *Cattle.*—The total number of cattle recorded at the War Census was 9,863,036, distributed as follows :—

Cattle recorded in the Commonwealth at the War Census of September, 1915.

Dairy Cattle.	Bulls.	Working Bullocks.	Calves (under 12 months).	All Other Cattle.	Total Cattle.
1,746,433	121,292	145,333	1,354,749	6,495,229	9,863,036

The total number of cattle shewn by the aggregate of the State annual returns for 1915 was 9,931,416, a figure which is fairly in accord with the War Census result given above. The State annual returns for 1915 gave a total of 1,684,393 dairy cattle, milking and dry, as compared with 1,746,433 recorded at the War Census.

(iv.) *Sheep.*—In the case of sheep the War Census total for September, 1915, was 68,124,100, as compared with an aggregate for 1915 of 69,257,189, compiled from the State annual returns.

8. **Vehicles.**—For the purpose of obtaining a register of the privately-owned means of transport that were available in Australia, each person was asked to furnish on his Wealth and Income Card the number, purpose, horse-power, etc., of any vehicles in his possession.

The geographical distribution of the data is, in this case as in all the others, dealt with in the Wealth Census according to domicile of the owners, not according to the location of the vehicles. Although there are probably many cases in which vehicles situated in one State are the property of persons resident in another State, such instances are not nearly so numerous as is the case with live stock, and consequently the figures obtained for the several States and Territories may be taken as furnishing a rough indication of the geographical distribution of the vehicles themselves. On this account the figures for States and Territories are given in the succeeding tables :—

Motor Vehicles and Traction Engines recorded, September, 1915.

Particulars.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'with.
NUMBER.									
Motor Cars	10,098	8,033	3,362	4,479	1,513	977	7	12	28,481
Taxi-cabs	171	42	17	18	5	7	..	..	260
Motor Cycles	5,516	6,454	1,146	2,946	811	765	7	21	17,666
Motor Omnibuses ..	19	55	6	4	..	10	..	..	94
Motor Lorries	394	114	144	144	28	15	..	..	839
Other Motor Vehicles ..	254	256	125	87	96	14	..	1	833
Traction Engines ..	607	628	242	63	64	100	1	2	1,707
HORSE POWER.									
Motor Cars	186,976	136,900	70,647	73,500	28,993	16,701	152	248	514,117
Taxi-cabs	3,181	671	357	227	135	101	..	..	4,672
Motor Cycles	20,997	25,141	4,128	10,983	2,876	2,982	25	81	67,213
Motor Omnibuses ..	343	1,561	160	70	..	278	..	..	2,412
Motor Lorries ..	8,992	2,584	3,754	3,251	673	440	..	..	19,694
Other Motor Vehicles ..	3,460	3,403	1,786	1,469	1,080	216	..	12	11,426
Traction Engines ..	6,449	6,541	2,913	897	1,219	910	7	18	18,954

The average horse-power recorded for the Commonwealth as a whole was 18 for motor cars and taxi-cabs, 3.8 for motor cycles, 25.7 for motor omnibuses, 23.5 for motor lorries, 13.7 for other motor vehicles, and 11.1 for traction engines.

Number of Vehicles recorded other than Motor Vehicles and Traction Engines, September, 1915.

Particulars.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
For cartage of goods and materials—									
Waggons	12,628	20,240	10,707	7,098	2,408	853	16	13	53,963
Lorries	4,037	6,161	926	769	900	324	..	2	13,119
Waggonettes, Vans & other Four-wheeled Vehicles, N.E.I.*	11,623	9,407	3,099	6,128	307	223	5	9	30,801
Drays	24,776	25,662	14,178	12,890	4,556	4,228	59	59	86,408
Spring Carts & other Two-wheeled Vehicles, N.E.I.*	32,738	26,271	15,386	8,436	9,119	3,020	8	31	95,009
For Conveyance of Passengers—									
Four-wheeled Cabs ..	591	834	304	112	55	76	..	..	1,972
Two-wheeled Cabs ..	201	201	87	8	12	1	..	..	510
Omnibuses and Drags	394	332	144	66	62	26	..	..	1,024
Buggies, Phaetons, Carriages, and other Four-wheeled Vehicles, N.E.I.*	23,862	39,423	12,206	17,819	3,346	2,011	69	39	98,775
Gigs and other Two-wheeled Vehicles, N.E.I.*	73,527	36,143	25,198	9,020	6,745	4,187	32	169	155,021
Bicycles other than Motor	11,672	17,030	5,779	6,510	2,105	2,099	13	24	45,232

* N.E.I. denotes "Not elsewhere included."

For the Commonwealth as a whole, there were recorded 581,834 vehicles other than motors and traction engines. Of these, 279,300 were for the cartage of goods and materials, 257,302 were horsed vehicles for the conveyance of passengers, and 45,232 were bicycles other than motor. Of the heavy class of vehicles, 97,883 were four-wheeled, and 181,417 were two-wheeled. Of the light-horsed vehicles, 101,771 were four-wheeled, while 155,531 were two-wheeled.

PART IV.—THE RELATIONS BETWEEN WEALTH AND INCOME.

CHAPTER I.—THE CORRELATION OF WEALTH AND INCOME.

1. **Numbers whose wealth and income are between given limits, Commonwealth.** The War Census, as already pointed out, did not include all, but included the great majority of the persons who were required to make returns. In the following table

Classification according to Assets and Income of War Census Returns

	Assets Groups. ⟶	Numbers of Persons in each Assets Group.							
		Debt and Nil.	Under £100.	£100 and under £250.	£250 and under £500.	£500 and under £750.	£750 and under £1000.	£1000 and under £2500.	£2500 and under £5000.
Income Groups.	Deficit and Nil—MALES.	5,351	28,254	7,254	5,762	3,456	2,382	7,285	3,713
	Under £50	32,676	56,984	19,097	14,740	7,516	4,428	7,511	1,884
	£50 and under £100 ..	82,684	151,113	37,583	23,368	10,745	6,109	12,569	2,833
	£100 ,, £150 ..	91,378	205,757	70,047	38,319	14,843	7,761	14,454	4,512
	£150 ,, £200 ..	26,893	69,435	41,001	28,308	12,868	6,984	12,643	4,434
	£200 ,, £300 ..	7,948	18,086	18,372	17,540	10,751	7,057	16,479	6,792
	£300 ,, £500 ..	2,043	3,170	4,448	6,166	4,538	3,775	12,156	7,382
	£500 ,, £750 ..	443	391	623	1,050	940	869	3,681	3,408
	£750 ,, £1,000 ..	126	76	126	265	256	231	1,074	1,372
	£1,000 ,, £1,500 ..	89	32	80	104	124	98	638	869
	£1,500 ,, £2,000 ..	33	13	22	43	29	31	180	234
	£2,000 ,, £3,000 ..	17	3	11	19	21	14	72	110
	£3,000 ,, £4,000 ..	6	..	2	3	10	3	20	22
	£4,000 ,, £5,000 ..	1	1	1	1	..	2	14	16
	£5,000 and upwards ..	5	..	1	1	4	2	3	12
	Totals	249,693	533,315	198,668	135,689	66,101	39,746	88,779	37,593
	£150 and under £156 ..	7,686	18,987	8,977	5,310	2,173	981	1,748	587
	£156 ,, £200 ..	19,207	50,448	32,024	22,998	10,695	6,003	10,895	3,847
Income Groups	Deficit and Nil—FEMALES.	8,356	178,979	39,124	14,305	3,900	1,567	2,319	609
	Under £50	56,217	110,456	50,379	42,926	20,464	9,974	10,235	762
	£50 and under £100 ..	37,581	78,533	15,068	10,489	6,112	4,577	13,888	1,637
	£100 ,, £150 ..	5,974	19,669	7,242	5,258	2,790	1,858	6,659	3,175
	£150 ,, £200 ..	1,004	3,083	2,331	1,902	1,193	829	2,963	2,544
	£200 ,, £300 ..	479	986	1,115	1,126	846	560	2,231	2,243
	£300 ,, £500 ..	229	323	410	523	368	335	1,284	1,155
	£500 ,, £750 ..	102	72	124	154	132	117	443	411
	£750 ,, £1,000 ..	32	25	34	52	41	40	155	163
	£1,000 ,, £1,500 ..	28	13	13	21	29	30	101	108
	£1,500 ,, £2,000 ..	13	1	2	9	10	12	31	33
	£2,000 ,, £3,000 ..	11	6	4	4	4	3	20	32
	£3,000 ,, £4,000 ..	7	..	..	1	4	2	5	7
	£4,000 ,, £5,000 ..	3	..	..	2	2	..	..	4
	£5,000 and upwards ..	..	..	..	..	..	1	2	2
	Totals	110,036	392,146	115,846	76,772	35,895	19,905	40,336	12,885
	£150 and under £156 ..	317	908	597	419	232	147	541	425
	£156 ,, £200 ..	687	2,175	1,734	1,483	961	682	2,422	2,119
Income Groups.	Deficit and Nil—PERSONS	13,707	207,233	46,378	20,067	7,356	3,949	9,604	4,322
	Under £50	88,893	167,440	69,476	57,666	27,980	14,402	17,746	2,646
	£50 and under £100 ..	120,265	229,646	52,651	33,857	16,857	10,686	26,457	4,470
	£100 ,, £150 ..	97,352	225,426	77,289	43,577	17,633	9,619	21,113	7,687
	£150 ,, £200 ..	27,897	72,518	43,332	30,210	14,061	7,813	15,606	6,978
	£200 ,, £300 ..	8,427	19,072	19,487	18,666	11,597	7,617	18,710	9,035
	£300 ,, £500 ..	2,272	3,493	4,858	6,689	4,906	4,110	13,440	8,537
	£500 ,, £750 ..	545	463	747	1,204	1,072	986	4,124	3,819
	£750 ,, £1,000 ..	158	101	160	317	297	271	1,229	1,535
	£1,000 ,, £1,500 ..	117	45	93	125	153	128	739	977
	£1,500 ,, £2,000 ..	46	14	24	52	39	43	211	267
	£2,000 ,, £3,000 ..	28	9	15	23	25	17	92	142
	£3,000 ,, £4,000 ..	13	..	2	4	14	5	25	29
	£4,000 ,, £5,000 ..	4	1	1	3	2	2	14	20
	£5,000 and upwards ..	5	..	1	1	4	3	5	14
	Totals	359,729	925,461	314,514	212,461	101,996	59,651	129,115	50,478
	£150 and under £156 ..	8,003	19,895	9,574	5,729	2,405	1,128	2,289	1,012
	£156 ,, £200 ..	19,894	52,623	33,758	24,481	11,656	6,685	13,317	5,966

the distribution of these is given according to ranges of income and ranges of assets, the aggregates for each range of income, and for each range of assets being also shewn.

If these distributions conformed perfectly to curves of a known type it would be possible to compute the mutual relations of wealth and income. Owing to limitations of numbers, however, and to the incompleteness of the returns, the progressions of the numbers only approximate to well-defined (and smooth) curves.

The figures given in this part relative to income and assets relate in each case to " net income" and " net assets."

furnished by Individuals as at 30th June, 1915. (Exclusive of Absentees.)

NUMBERS OF PERSONS IN EACH ASSETS GROUP.									Aggregate of Incomes.
£5000 and under £10,000.	£10,000 and under £15,000.	£15,000 and under £20,000.	£20,000 and under £25,000.	£25,000 and under £50,000.	£50,000 and under £75,000.	£75,000 and under £100,000.	£100,000 and upwards.	Total for All Values of Assets.	
1,869	519	200	95	189	60	30	41	66,460	..
548	82	20	13	13	1	..	..	145,513	4,163,492
647	118	38	12	13	3	..	..	327,835	24,308,245
905	141	40	14	19	3	2	..	448,195	55,089,955
1,156	168	46	18	20	5	1	..	203,980	34,312,169
2,745	375	97	41	32	6	1	2	106,324	25,190,643
4,069	915	258	89	76	19	3	1	49,108	18,388,257
2,819	1,030	387	126	137	16	5	3	15,928	9,603,396
1,448	650	325	180	164	11	6	3	6,313	5,392,909
1,178	648	404	261	348	47	6	7	4,933	5,993,503
449	324	232	147	315	57	16	7	2,132	3,676,422
258	256	208	140	402	125	25	26	1,707	4,149,389
52	53	58	66	211	104	28	21	659	2,248,692
24	22	30	41	104	50	32	36	375	1,685,277
9	12	23	40	136	134	94	270	746	7,300,348
18,176	5,313	2,366	1,283	2,179	641	249	417	1,380,208	201,502,697
154	18	5	2	1	1	..	..	46,630	7,092,731
1,002	150	41	16	19	4	1	..	157,350	27,219,438
214	50	15	10	15	7	2	4	249,476	..
143	24	7	2	2	1	..	..	301 592	6,716,909
193	13	8	3	3	1	..	..	168,106	11,416,318
269	25	7	..	3	..	..	..	52,929	6,250,478
461	25	7	5	1	..	..	..	16,348	2,769,270
1,292	86	19	8	7	2	1	..	11,001	2,641,110
1,584	329	38	17	19	2	..	1	6,617	2,498,288
519	407	134	47	23	5	..	1	2,691	1,632,945
204	179	127	62	30	1	..	..	1,145	969,926
162	122	102	67	102	4	2	1	905	1,089,209
63	48	32	28	73	8	..	1	364	629,439
50	39	17	17	77	24	5	4	317	771,511
14	8	8	3	26	7	4	6	102	360,818
6	4	3	5	11	10	6	2	58	258,390
9	3	6	5	14	9	6	29	86	655,896
5,183	1,362	530	279	406	81	26	49	811,737	38,660,507
57	5	..	2	1	..	..	..	3,651	557,963
404	20	7	3	..	..	..	..	12,697	2,211,307
2,083	569	215	105	204	67	32	45	315,936	..
691	106	27	15	15	2	..	..	447,105	10,880,401
840	131	46	15	16	4	..	..	495,941	35,724,563
1,174	166	47	14	22	3	2	..	501,124	61,340,433
1,617	193	53	23	21	5	1	..	220,328	37,081,439
4,037	461	116	49	39	8	2	2	117,325	27,831,753
5,653	1,244	296	106	95	21	3	2	55,725	20,886,545
3,338	1,437	521	173	160	21	5	4	18,619	11,236,341
1,652	829	452	242	194	12	6	3	7,458	6,362,835
1,340	770	506	328	450	51	8	8	5,838	7,082,712
512	372	264	175	388	65	16	8	2,496	4,305,861
308	295	225	157	479	149	30	30	2,024	4,920,900
66	61	66	69	237	111	32	27	761	2,609,510
30	26	33	46	115	60	38	38	433	1,943,667
18	15	29	45	150	143	100	299	832	7,956,244
23,359	6,675	2,896	1,562	2,585	722	275	466	2,191,945	240,163,204
211	23	5	4	2	1	..	..	50,281	7,650,694
1,406	170	48	19	19	4	1	..	170,047	29,430,745

2. **Aggregates of assets between given limits arranged according to given limits of income, Commonwealth.**—In the following table are shewn the aggregates of wealth of the males, females, and persons, the numbers of which were given in the preceding table, the aggregates of the incomes being repeated in the final columns,

Distribution in Respect of Individuals of Australia

	Assets Groups. ⟶	Debt and Nil. No. of Persons.	Aggregates of Assets. Under £100.	£100 and under £250.	£250 and under £500.	£500 and under £750.	£750 and under £1000.	£1000 and under £2500.	£250 and un £500
			£	£	£	£	£	£	£
Income Groups.	Deficit and Nil—MALES	5,351	694,636	1,177,570	2,052,253	2,118,199	2,059,145	11,656,698	13,095
	Under £50 ..	32,676	1,584,976	3,104,982	5,240,035	4,572,289	3,818,478	11,304,420	6,366
	£50 and under £100	82,684	4,228,634	5,988,097	8,255,118	6,529,629	5,279,649	19,276,323	9,350
	£100 ,, £150	91,378	6,905,518	11,067,901	13,428,330	8,968,096	6,672,895	22,166,436	15,052
	£150 ,, £200	26,893	2,753,747	6,595,873	10,058,936	7,847,938	6,037,111	19,374,692	15,155
	£200 ,, £300	7,948	781,694	3,062,239	6,317,693	6,566,353	6,096,203	25,771 968	23,674
	£300 ,, £500	2,043	144,243	768,286	2,255,186	2,808,435	3,273,772	19,837,140	26,009
	£500 ,, £750	443	19,433	107,637	390,299	592,783	760,654	6,163,252	12,237
	£750 ,, £1,000	126	3,704	21,086	99,532	161,072	202,041	1,834,990	4,899
	£1,000 ,, £1,500	89	1,885	13,770	38,967	77,707	85,989	1,105,560	3,235
	£1,500 ,, £2,000	33	747	4,163	15,944	18,384	26,933	325,032	895
	£2,000 ,, £3,000	17	138	2,002	6,547	12,967	12,085	120,767	415
	£3,000 ,, £4,000	6	..	321	1,087	6,038	2,817	38,025	86
	£4,000 ,, £5,000	1	10	200	367	..	1,729	19,831	57
	£5,000 and upwards	5	..	147	489	2,237	1,761	6,129	43
	Totals ..	249,693	17,119,415	31,914,274	48,160,783	40,282,127	34,331,262	139,001,263	130,573
	£150 and under £156	7,686	720,041	1,424,556	1,861,283	1,311,201	845,500	2,652,126	1,991
	£156 ,, £200	19,207	2,033,706	5,171,317	8,197,653	6,536,737	5,191,611	16,722,566	13,163
Income Groups.	Deficit & Nil—FEMALES	8,356	5,072,207	5,899,669	4,859,714	2,321,280	1,337,485	3,423,330	2,064
	Under £50 ..	56,217	3,132,666	8,269,102	15,167,734	12,290,021	8,579,531	13,901,712	2,476
	£50 and under £100	37,581	1,921,916	2,396,753	3,734,515	3,752,857	3,962,940	21,132,151	5,151
	£100 ,, £150	5,974	659,580	1,152,046	1,875,713	1,709,469	1,597,608	11,134,215	10,283
	£150 ,, £200	1,004	123,072	387,260	691,855	737,443	730,842	4,928,803	8,871
	£200 ,, £300	479	45,465	187,913	406,554	520,591	486,140	3,678,251	8,277
	£300 ,, £500	229	14,741	70,908	192,852	227,193	290,238	2,130,582	4,164
	£500 ,, £750	102	3,193	21,385	58,483	81,338	102,640	753,000	1,526
	£750 ,, £1,000	32	1,397	5,874	18,282	25,656	35,007	266,065	595
	£1,000 ,, £1,500	28	647	2,341	7,713	18,029	26,347	166,965	393
	£1,500 ,, £2,000	13	80	340	3,298	6,325	10,546	49,108	123
	£2,000 ,, £3,000	11	270	741	1,350	2,363	2,525	33,274	121
	£3,000 ,, £4,000	7	..	..	253	2,475	1,630	8,167	24
	£4,000 ,, £5,000	3	..	..	600	1,138	..	..	16
	£5,000 and upwards	..	..	..	..	..	771	3,722	8
	Totals ..	110,036	10,975,234	18,394,332	27,018,916	21,696,178	17,164,250	61,609,345	44,097
	£150 and under £156	317	34,017	96,527	149,864	143,713	128,865	901,048	1,420
	£156 ,, £200	687	89,055	290,733	541,991	593,730	601,977	4,027,755	7,451
Income Groups.	Deficit & Nil—PERSONS	13,707	5,766,893	7,077,239	6,911,967	4,439,479	3,396,630	15,080,028	15,159
	Under £50 ..	88,893	4,717,642	11,374,084	20,407,769	16,862,310	12,398,009	25,206,132	8,843
	£50 and under £100	120,265	6,150,550	8,384,850	11,989,633	10,282,486	9,242,589	40,408,474	14,502
	£100 ,, £150	97,352	7,565,098	12,219,947	15,304,043	10,677,565	8,270,503	33,300,651	25,335
	£150 ,, £200	27,897	2,876,819	6,983,133	10,750,791	8,585,381	6,767,953	24,303,495	24,026
	£200 ,, £300	8,427	827,159	3,250,152	6,724,247	7,086,944	6,582,343	29,450,219	31,951
	£300 ,, £500	2,272	158,984	839,194	2,448,038	3,035,628	3,564,010	21 967,722	30,173
	£500 ,, £750	545	22,626	129,022	448,782	674,121	863,294	6,916,252	13,763
	£750 ,, £1,000	158	5,101	26,960	117,814	186,728	237,048	2,101,055	5,495
	£1,000 ,, £1,500	117	2,532	16,111	46,680	95,736	112,336	1,272,525	3,628
	£1,500 ,, £2,000	46	827	4,503	19,242	24,709	37,479	374,140	1,018
	£2,000 ,, £3,000	28	408	2,743	7,897	15,330	14,610	154,041	536
	£3,000 ,, £4,000	13	..	321	1,340	8,513	4,447	46,192	116
	£4,000 ,, £5,000	4	10	200	967	1,138	1,729	19,831	72
	£5,000 and upwards	5	..	147	489	2,237	2,532	9,851	51
	Totals ..	359,729	28,094,649	50,308,606	75,179,699	61,978,305	51,495,512	200,610,608	174,67
	£150 and under £156	8,003	754,058	1,521,083	2,011,147	1,454,914	974,365	3,553,174	3,41
	£156 ,, £200	19,894	2,122,761	5,462,050	8,739,644	7,130,467	5,793,588	20,750,321	20,61

immediately following the aggregates of the wealth. Thus the two last columns for males, females, and persons, shew, according to given ranges of income, what may be regarded as the income associated with the possession of a given amount of wealth. In a later table the ratios of income to wealth are shewn in the form of percentages.

Assets as at 30th June, 1915, in each Income Group.

AGGREGATES OF ASSETS.									Aggregate of Incomes.
£5000 d under 10,000.	£10,000 and under £15,000.	£15,000 and under £20,000.	£20,000 and under £25,000.	£25,000 and under £50,000.	£50,000 and under £75,000.	£75,000 and under £100,000.	£100,000 and upwards.	All Values.	
£	£	£	£	£	£	£	£	£	£
2,988,941	6,231,582	3,460,818	2,110,039	6,498,655	3,772,417	2,590,121	7,333,864	77,790,445	..
3,618,281	957,455	340,458	283,690	412,219	61,866	..	..	41,665,576	4,163,492
4,361,630	1,399,757	630,721	272,604	439,793	182,305	..	..	66,195,228	24,308,245
5,996,601	1,691,313	667,605	319,840	625,604	178,813	162,482	..	93,903,549	55,089,955
7,536,156	1,992,539	810,111	398,593	642,620	285,128	76,022	..	79,564,947	34,312,169
3,149,027	4,445,835	1,650,122	904,978	1,050,806	358,459	82,689	207,379	99,119,831	25,190,643
7,925,010	10,860,543	4,384,461	2,005,526	2,488,597	1,117,485	245,955	143,493	104,267,330	18,388,257
9,893,872	12,414,585	6,631,287	2,784,613	4,446,574	974,337	419,939	327,960	68,164,568	9,603,396
0,339,311	7,980,033	5,636,786	4,012,285	5,200,828	670,139	489,014	406,972	41,957,129	5,292,909
3,550,560	7,931,189	6,938,130	5,833,517	11,297,904	2,838,592	487,776	874,131	49,311,214	5,993,503
3,265,293	3,996,725	4,021,276	3,289,574	10,771,318	3,442,878	1,377,628	878,551	32,329,755	3,676,422
1,954,375	3,193,713	3,629,202	3,167,780	14,014,312	7,336,296	2,135,056	3,688,558	39,688,842	4,149,389
399,487	655,508	1,016,196	1,465,065	7,514,373	6,358,597	2,400,273	2,841,435	22,785,309	2,248,692
177,745	282,280	532,161	999,003	3,736,449	3,071,700	2,774,654	5,936,983	17,590,373	1,685,277
73,647	147,591	403,184	923,286	5,230,960	8,356,736	8,138,093	60,428,416	83,756,101	7,300,348
5,229,936	64,180,648	40,752,518	28,770,393	74,371,012	38,955,747	21,379,702	83,067,742	918,090,197	201,502,697
992,739	220,041	85,997	42,201	36,262	50,538	..	..	12,233,981	7,092,731
6,543,417	1,772,498	724,114	356,392	606,358	234,590	76,022	..	67,330,966	27,219,438
1,427,190	611,523	263,090	218,502	512,314	426,255	171,098	460,750	29,068,881	..
947,760	275,084	113,929	42,250	73,363	71,363	..	..	65,341,283	6,716,909
1,250,103	157,720	134,903	68,439	88,502	54,485	..	..	43,806,391	11,416,318
1,712,458	294,934	121,520	..	95,047	..	..	..	30,635,630	6,250,478
2,912,222	285,758	118,096	109,931	28,033	..	..	..	19,924,462	2,769,270
8,290,255	983,578	313,224	172,400	247,046	112,882	82,153	..	23,803,723	2,641,110
1,198,772	3,816,663	652,020	388,255	650,937	121,877	..	147,957	24,067,057	2,498,288
3,889,939	4,982,105	2,280,103	1,041,425	705,413	287,933	..	116,982	15,850,588	1,632,945
1,485,709	2,215,599	2,223,374	1,378,049	919,146	68,258	..	..	9,238,268	969,,926
1,169,862	1,521,500	1,809,303	1,511,189	3,312,945	243,174	158,194	186,225	10,527,877	1,089,209
468,514	591,117	576,700	640,021	2,465,472	452,174	..	148,295	5,535,667	629,439
371,961	501,472	303,095	368,280	2,833,674	1,440,271	436,861	637,146	7,054,829	771,511
100,776	102,696	132,213	67,416	948,590	473,773	330,276	700,142	2,892,704	360,818
40,172	52,393	49,380	107,141	391,170	593,236	534,911	280,265	2,066,774	258,390
75,458	39,028	100,478	112,825	499,587	580,573	527,409	6,379,212	8,327,331	655,896
5,341,151	16,431,170	9,191,428	6,226,123	13,771,239	4,926,254	2,240,902	9,056,974	298,141,465	38,660,507
393,375	60,867	..	40,139	28,033	..	..	..	3,396,551	557,963
2,518,847	224,891	118,096	69,792	..	..	..	..	16,527,911	2,211,307
7,416,131	6,843,105	3,723,908	2,328,541	7,010,969	4,148,671	2,761,219	7,794,614	106,859,326	..
1,566,041	1,232,539	454,387	325,940	485,582	133,229	..	..	107,006,859	10,880,401
2,611,733	1,557,477	765,624	341,043	528,295	236,790	..	..	110,001,619	35,724,563
1,709,059	1,986,247	789,125	319,840	720,651	178,813	162,482	..	124,539,179	61,340,433
0,448,378	2,278,297	928,207	508,524	670,653	285,128	76,022	..	99,489,409	37,081,439
5,439,282	5,429,413	1,963,346	1,077,378	1,297,852	471,341	164,842	207,379	122,923,554	27,831,753
9,123,782	14,677,206	5,036,481	2,393,781	3,139,534	1,239,362	245,955	291,450	128,334,387	20,886,545
5,783,811	17,396,690	8,911,390	3,826,038	5,151,987	1,262,270	419,939	444,942	84,015,156	11,236,341
1,825,020	10,195,632	7,860,160	5,390,334	6,119,974	738,397	489,014	406,972	51,195,397	6,362,835
2,720,422	9,452,689	8,747,433	7,344,706	14,610,849	3,081,766	645,970	1,060,356	59,839,091	7,082,712
1,733,867	4,587,842	4,597,976	3,929,595	13,236,790	3,895,052	1,377,628	1,026,846	37,865,422	4,305,861
1,326,336	3,695,185	3,932,297	3,536,060	16,847,986	8,776,567	2,571,917	4,325,704	46,743,671	4,920,900
500,263	758,204	1,148,409	1,532,481	8,462,963	6,832,370	2,730,549	3,541,577	25,678,013	2,609,510
217,917	334,673	581,541	1,106,144	4,127,619	3,664,936	3,309,565	6,217,248	19,657,147	1,943,667
149,105	186,619	503,662	1,036,111	5,730,547	8,937,309	8,665,502	66,807,628	92,083,432	7,956,244
5,571,087	80,611,818	49,943,946	34,996,516	88,142,251	43,882,001	23,620,604	92,124,716	1,216,231,662	240,163,204
1,386,114	280,908	85,997	82,340	64,295	50,538	..	..	15,630,532	7,650,694
2,002,264	1,997,389	842,210	426,184	606,358	234,590	76,022	..	83,858,877	29,430,745

3. Numbers in each State and Territory arranged according to given limits of income.—In the following table are given the numbers of males, females and persons whose incomes lie between the limits indicated in the first column. The general *similarity* of the distributions for each State is obvious, although by no means identical; the measure of their agreement or difference can only be fully appreciated by expressing each as a ratio to the totals in the last lines. The calculation of these ratios has not, however, been undertaken.

Commonwealth, States and Territories.—Number of Returns in Respect of Individuals in each Income Group for year ended 30th June, 1915. (Exclusive of Absentees.)

Income Group.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wealth.
Deficit and Nil—MALES	17,940	24,182	7,044	9,213	6,000	1,936	141	4	66,460
Under £50	46,239	47,965	19,360	18,053	6,915	6,798	114	69	145,513
£50 and under £100 ..	121,505	94,175	48,969	31,301	14,272	17,206	254	153	327,835
£100 „ £150 ..	179,483	124,590	67,184	38,633	23,631	14,162	277	235	448,195
£150 „ £156 ..	19,377	11,700	6,982	3,604	3,788	1,113	47	19	46,630
£156 „ £200 ..	63,797	41,651	21,314	11,970	14,610	3,772	147	89	157,350
£200 „ £300 ..	42,337	27,899	15,166	7,789	10,317	2,568	195	53	106,324
£300 „ £500 ..	20,005	14,420	6,786	3,293	3,215	1,280	71	38	49,108
£500 „ £750 ..	6,576	4,849	2,080	993	953	440	28	9	15,928
£750 „ £1,000 ..	2,541	2,018	833	418	336	161	5	1	6,313
£1,000 „ £1,500 ..	1,989	1,613	664	292	249	119	5	2	4,933
£1,500 „ £2,000 ..	846	694	278	165	97	50	2	..	2,132
£2,000 „ £3,000 ..	683	534	232	134	80	40	4	..	1,707
£3,000 „ £4,000 ..	262	212	102	41	26	16	..	..	659
£4,000 „ £5,000 ..	153	132	42	29	16	3	..	..	375
£5,000 and upwards ..	314	266	80	50	27	9	..	..	746
Totals	524,047	396,900	197,116	125,978	84,532	49,673	1,290	672	1,380,208
Deficit & Nil—FEMALES	78,038	91,464	37,683	24,971	9,383	7,822	34	81	249,476
Under £50	97,215	112,760	35,440	34,993	10,281	10,810	22	71	301,592
£50 and under £100 ..	57,738	65,849	19,318	13,800	6,120	5,250	9	22	168,106
£100 „ £150 ..	20,016	18,745	5,887	3,972	2,883	1,406	10	10	52,929
£150 „ £156 ..	1,506	1,238	347	261	224	75	..	..	3,651
£156 „ £200 ..	4,868	4,403	1,292	960	794	373	4	3	12,697
£200 „ £300 ..	4,347	3,899	1,081	818	516	338	1	1	11,001
£300 „ £500 ..	2,531	2,487	649	507	244	196	..	3	6,617
£500 „ £750 ..	1,033	1,018	256	210	102	72	..	..	2,691
£750 „ £1,000 ..	487	420	93	80	33	29	1	2	1,145
£1,000 „ £1,500 ..	380	321	87	59	22	33	2	1	905
£1,500 „ £2,000 ..	153	117	48	31	6	9	..	..	364
£2,000 „ £3,000 ..	96	127	39	29	12	11	3	..	317
£3,000 „ £4,000 ..	43	42	8	7	..	2	..	..	102
£4,000 „ £5,000 ..	18	27	5	6	1	1	..	..	58
£5,000 and upwards ..	40	29	9	5	2	1	..	..	86
Totals	268,509	302,946	102,242	80,709	30,623	26,428	86	194	811,737
Deficit & Nil—PERSONS	95,978	115,646	44,727	34,184	15,383	9,758	175	85	315,936
Under £50	143,454	160,725	54,800	53,046	17,196	17,608	136	140	447,105
£50 and under £100 ..	179,243	160,024	68,287	45,101	20,392	22,456	263	175	495,941
£100 „ £150 ..	199,499	143,335	73,071	42,605	26,514	15,568	287	245	501,124
£150 „ £156 ..	20,883	12,938	7,329	3,865	4,012	1,188	47	19	50,281
£156 „ £200 ..	68,665	46,054	22,606	12,930	15,404	4,145	151	92	170,047
£200 „ £300 ..	46,684	31,798	16,247	8,607	10,833	2,906	196	54	117,325
£300 „ £500 ..	22,536	16,907	7,435	3,800	3,459	1,476	71	41	55,725
£500 „ £750 ..	7,609	5,867	2,336	1,203	1,055	512	28	9	18,619
£750 „ £1,000 ..	3,028	2,438	926	498	369	190	6	3	7,458
£1,000 „ £1,500 ..	2,369	1,934	751	351	271	152	7	3	5,838
£1,500 „ £2,000 ..	999	811	326	196	103	59	2	..	2,496
£2,000 „ £3,000 ..	779	661	271	163	92	51	7	..	2,024
£3,000 „ £4,000 ..	305	254	110	48	26	18	..	..	761
£4,000 „ £5,000 ..	171	159	47	35	17	4	..	..	433
£5,000 and upwards ..	354	295	89	55	29	10	..	..	832
Totals	792,556	699,846	299,358	206,687	115,155	76,101	1,376	866	2,191,945

4. Aggregates of income in each State according to given limits of income.—In the following table are shewn for each State and the Commonwealth the aggregates of the "net incomes" for males, females and persons arranged according to limits of income, which correspond to the numbers given in the preceding table. The totals

for the Commonwealth agree, of course, with the final column in the tables of sections 1 and 2 of this chapter. The identity or difference of the distributions (of incomes) is revealed by dividing by the totals in the final lines. The ratios so found shew how the aggregates of incomes in the various groups are distributed according to the magnitude of the income. This relative distribution has been given for the Commonwealth as a whole on p. 25 for each sex and for persons.

Commonwealth, States and Territories.—Aggregate Net Income in Respect of Individuals in each Income Group for year ended 30th June, 1915. (Exclusive of Absentees).

Income Group.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wealth.
	£	£	£	£	£	£	£	£	£
Deficit and Nil—MALES ..	..	..	..	..	..	..	..	..	..
Under £50 ..	1,346,629	1,344,100	577,961	496,697	189,478	203,409	3,226	1,992	4,163,492
£50 and under £100	9,056,099	6,942,318	3,640,033	2,309,471	1,062,040	1,268,883	18,477	10,924	24,308,245
£100 „ £150	22,138,778	15,342,756	8,195,896	4,700,410	2,940,994	1,709,780	33,259	28,082	55,089,955
£150 „ £156	2,952,944	1,771,307	1,059,049	556,572	572,648	170,227	7,094	2,890	7,092,731
£156 „ £200	11,033,838	7,195,857	3,686,565	2,057,652	2,556,557	647,398	25,894	15,677	27,219,438
£200 „ £300	10,033,534	6,621,978	3,596,728	1,851,504	2,409,338	619,549	45,904	12,108	25,190,643
£300 „ £500	7,499,992	5,424,691	2,523,270	1,224,142	1,192,731	483,357	26,068	14,006	18,388,257
£500 „ £750	3,982,406	2,909,034	1,251,685	603,058	571,773	264,067	16,024	5,349	9,603,396
£750 „ £1,000	2,133,023	1,756,787	719,252	357,102	286,297	134,882	4,589	977	5,392,909
£1,000 „ £1,500	2,405,447	1,970,412	806,417	355,325	300,914	147,027	5,450	2,511	5,993,503
£1,500 „ £2,000	1,463,144	1,198,171	475,794	285,670	165,372	85,244	3,027	..	3,676,422
£2,000 „ £3,000	1,660,607	1,292,882	561,502	330,752	194,560	100,808	8,278	..	4,149,389
£3,000 „ £4,000	885,838	727,467	352,259	142,312	89,400	51,416	..	..	2,248,692
£4,000 „ £5,000	688,736	590,296	188,724	133,077	71,088	13,356	..	..	1,685,277
£5,000 and upwards	3,127,681	2,468,791	764,902	567,619	304,888	66,467	..	..	7,300,348
Totals	80,408,696	57,556,847	28,400,037	15,971,363	12,908,078	5,965,870	197,290	94,516	201,502,697
Deficit & Nil—FEMALES ..	..	..	..	..	..	..	..	..	..
Under £50 ..	2,172,002	2,580,592	787,523	728,971	211,538	234,429	490	1,364	6,716,909
£50 and under £100	3,944,533	4,431,332	1,322,016	937,136	425,362	353,788	689	1,462	11,416,318
£100 „ £150	2,357,247	2,218,041	695,171	464,959	346,461	166,241	1,214	1,144	6,250,478
£150 „ £156	230,374	189,906	52,886	39,383	33,970	11,444	..	..	557,963
£156 „ £200	847,711	767,043	225,648	167,939	135,743	66,024	681	518	2,211,307
£200 „ £300	1,050,496	933,813	257,698	196,138	121,449	81,118	203	205	2,641,110
£300 „ £500	952,342	938,986	246,747	193,075	91,013	75,068	..	1,057	2,498,288
£500 „ £750	621,395	621,493	156,008	125,988	64,395	43,666	..	..	1,632,945
£750 „ £1,000	414,814	354,785	78,305	67,958	26,493	24,727	960	1,884	969,926
£1,000 „ £1,500	458,656	383,522	105,187	70,867	26,073	41,430	2,443	1,031	1,089,209
£1,500 „ £2,000	262,037	202,603	84,178	53,371	11,427	15,823	..	..	629,439
£2,000 „ £3,000	236,288	312,160	90,201	69,805	28,537	28,322	6,198	..	771,511
£3,000 „ £4,000	154,461	146,699	27,875	24,722	..	7,061	..	..	360,818
£4,000 „ £5,000	79,995	121,381	21,819	26,970	4,162	4,063	..	..	258,390
£5,000 and upwards	347,090	204,348	56,947	31,511	10,226	5,774	..	..	655,896
Totals	14,129,441	14,406,704	4,208,209	3,198,793	1,536,849	1,158,968	12,878	8,665	38,660,507
Deficit & Nil—PERSONS ..	..	..	..	..	..	..	..	..	..
Under £50 ..	3,518,631	3,924,692	1,365,484	1,225,668	401,016	437,838	3,716	3,356	10,880,401
£50 and under £100	13,000,632	11,373,650	4,962,049	3,246,607	1,487,402	1,622,671	19,166	12,386	35,724,563
£100 „ £150	24,496,025	17,560,797	8,891,067	5,165,369	3,287,455	1,876,021	34,473	29,226	61,340,433
£150 „ £156	3,183,318	1,961,213	1,111,935	595,955	606,618	181,671	7,094	2,890	7,650,694
£156 „ £200	11,881,549	7,962,900	3,912,213	2,225,591	2,692,300	713,422	26,575	16,195	29,430,745
£200 „ £300	11,084,030	7,555,791	3,854,426	2,047,642	2,530,787	700,657	46,107	12,313	27,831,753
£300 „ £500	8,452,334	6,363,677	2,770,017	1,417,217	1,283,744	558,425	26,068	15,063	20,886,545
£500 „ £750	4,603,801	3,530,527	1,407,693	729,046	636,168	307,733	16,024	5,349	11,236,341
£750 „ £1,000	2,547,837	2,111,572	797,557	425,060	312,790	159,609	5,549	2,861	6,362,835
£1,000 „ £1,500	2,864,103	2,353,934	911,604	426,192	326,987	188,457	7,893	3,542	7,082,712
£1,500 „ £2,000	1,725,181	1,400,774	559,972	339,041	176,799	101,067	3,027	..	4,305,861
£2,000 „ £3,000	1,896,895	1,605,042	651,703	400,557	223,097	129,130	14,476	..	4,920,900
£3,000 „ £4,000	1,040,299	874,166	380,134	167,034	89,400	58,477	..	..	2,609,510
£4,000 „ £5,000	768,731	711,677	210,543	160,047	75,250	17,419	..	..	1,943,667
£5,000 and upwards	3,474,771	2,673,139	821,849	599,130	315,114	72,241	..	..	7,956,244
Totals	94,538,137	71,963,551	32,608,246	19,170,156	14,444,927	7,124,838	210,168	103,181	240,163,204

5. **Aggregates of wealth in each State, according to given limits of income.**—In the following table the aggregate amounts of wealth are shewn for each State within given limits of income ; corresponding to the aggregates of income shewn in the table of section 4, and the numbers of males, females, and persons shewn in section 3.

This table, together with the preceding, brings the States into comparison in respect of the wealth and income in each income group.

The ratios of the assets in each column to the total thereof shew the relative distribution according to ranges of income, and are by no means identical for the various States. These ratios, however, have not been regarded as of sufficient importance to tabulate.

Commonwealth, States and Territories.—Aggregate in Respect of Individuals of the Net Assets as at 30th June, 1915, in each Income Group. (Exclusive of Absentees.)

Income Group.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wealth.
	£	£	£	£	£	£	£	£	£
Deficit and Nil—MALES	27,891,182	26,469,298	5,607,439	11,607,025	4,811,400	1,051,185	352,027	889	77,790,445
Under £50 ..	11,965,531	14,151,514	4,753,499	7,071,842	2,238,977	1,454,215	14,161	15,837	41,665,576
£50 and under £100	21,961,578	20,379,996	8,825,562	8,824,327	2,927,271	3,203,534	25,633	47,327	66 195,228
£100 ,, £150	33,957,551	28,145,762	13,471,383	10,518,821	4,267,544	3,473,198	31 873	37,417	93,903,549
£150 ,, £156	4,640,397	3,504,545	1,765,464	1,256,443	635,351	420,245	8,460	3,076	12,233,981
£156 ,, £200	25,543,127	20,320,552	8,562,997	7,007,301	3,515,959	2,333,089	25,131	22,810	67,330,966
£200 ,, £300	40,475,776	29,447,810	11,946,523	9,101,505	5,130,707	2,933,833	56,092	27,585	99,119,831
£300 ,, £500	43,709,944	32,101,623	11,886,716	8,636,591	4,564,828	3,234,544	60,159	72,925	104,267,330
£500 ,, £750	30,202,069	20,418,910	6,876,826	5,198,949	3,096,071	2,282,958	82,477	6,308	68,164,568
£750 ,, £1,000	17,822,806	13,172,485	5,027,319	2,969,285	1,746,673	1,181,162	28,549	8,850	41,957,129
£1,000 ,, £1,500	21,671,017	15,153,704	5,820,768	3,145,168	2,042,430	1,422,420	27,684	28,023	49,311,214
£1,500 ,, £2,000	13,881,423	10,281,281	3,510,759	2,546,982	1,246,199	857,943	5,168	..	32,329,755
£2,000 ,, £3,000	16,748,141	12,064,066	4,567,880	3,460,691	1,695,290	1,106,296	46,478	..	39,688,842
£3,000 ,, £4,000	9,462,531	6,995,931	3,120,023	1,780,980	935,004	490,840	..	..	22,785,309
£4,000 ,, £5,000	7,400,660	6,608,941	1,657,037	1,182,217	645,151	96,367	..	..	17,590,373
£5,000 and upwards	34,860,125	30,096,605	5,982,625	9,369,575	2,633,549	813,622	..	..	83,756,101
Totals	362,193,858	289,313,023	103,382,820	93,677,702	42,132,404	26,355,451	763,892	271,047	918,090,197
Deficit & Nil–FEMALES	8,120,072	11,637,978	4,464,858	2,539,993	1,633,876	656,609	11,549	3,946	29,068,881
Under £50 ..	20,573,042	24,512,827	7,556,352	7,900,093	2,686,596	2,087,869	9,924	14,580	65,341,283
£50 and under £100	14,325,510	17,184,369	4,326,398	4,817,110	1,506,778	1,641,098	3,017	2,111	43,806,391
£100 ,, £150	10,755,940	11,731,886	3,052,142	2,919,757	1,095,699	1,076,338	1,561	2,307	30,635,630
£150 ,, £156	1,359,069	1,239,277	354,934	287,521	69,107	86,643	..	..	3,396,551
£156 ,, £200	6,109,491	6,187,227	1,498,789	1,570,029	541,491	614,961	3,770	2,153	16,527,911
£200 ,, £300	9,328,730	8,636,444	2,132,703	2,067,841	742,389	891,436	193	3,987	23,803,723
£300 ,, £500	9,477,989	8,820,930	2,068,078	2,034,519	842,418	812,069	..	11,054	24,067,057
£500 ,, £750	6,671,184	5,456,277	1,478,068	1,359,605	492,846	392,608	..	..	15,850,588
£750 ,, £1,000	4,139,314	3,325,919	622,005	644,076	298,430	192,205	160	16,159	9,238,268
£1,000 ,, £1,500	4,392,238	3,969,264	703,284	803,403	197,729	434,535	12,208	15,216	10,527,877
£1,500 ,, £2,000	2,286,765	1,857,129	473,537	604,076	76,585	237,575	..	..	5,535,667
£2,000 ,, £3,000	2,133,487	3,012,994	688,080	691,101	263,248	236,468	29,451	..	7,054,829
£3,000 ,, £4,000	1,362,073	1,138,171	248,267	136,857	..	7,336	..	..	2,892,704
£4,000 ,, £5,000	636,566	1,056,128	200,430	150,448	570	22,632	..	..	2,066,774
£5,000 and upwards	5,078,994	2,399,623	271,811	491,855	16,834	68,214	..	..	8,327,331
Totals	106,750,464	112,166,443	30,139,736	29,018,284	10,464,596	9,458,596	71,833	71,513	298,141,465
Deficit & Nil–PERSONS	36,011,254	38,107,276	10,072,297	14,147,018	6,445,276	1,707,794	363,576	4,835	106,859,326
Under £50 ..	32,538,573	38,664,341	12,309,851	14,971,935	4,925,573	3,542,084	24,085	30,417	107,006,859
£50 and under £100	36,287,088	37,564,365	13,151,960	13,641,437	4,434,049	4,844,632	28,650	49,438	110,001,619
£100 ,, £150	44,713,491	39,877,648	16,523,525	13,438,578	5,363,243	4,549,536	33,434	39,724	124,539,179
£150 ,, £156	5,999,466	4,743,822	2,120,398	1,543,964	704,458	506,888	8,460	3,076	15,630,532
£156 ,, £200	31,652,618	26,507,779	10,061,786	8,577,330	4,057,450	2,948,050	28,901	24,963	83,858,877
£200 ,, £300	49,804,506	38,084,254	14,079,226	11,169,346	5,873,096	3,825,269	56,285	31,572	122,923,554
£300 ,, £500	53,187,933	40,922,553	13,954,794	10,671,110	5,407,246	4,046,613	60,159	83,979	128,334,387
£500 ,, £750	36,873,253	25,875,187	8,354,894	6,558,554	3,588,917	2,675,566	82,477	6,308	84,015,156
£750 ,, £1,000	21,962,120	16,498,404	5,649,324	3,613,361	2,045,103	1,373,367	28,709	25,009	51,195,397
£1,000 ,, £1,500	26,063,255	19,122,968	6,524,052	3,948,571	2,240,159	1,856,955	39,892	43,239	59,839,091
£1,500 ,, £2,000	16,168,188	12,138,410	3,984,296	3,151,058	1,322,784	1,095,518	5,168	..	37,865,422
£2,000 ,, £3,000	18,881,628	15,077,060	5,255,960	4,151,792	1,958,538	1,342,764	75,929	..	46,743,671
£3,000 ,, £4,000	10,824,604	8,134,102	3,368,290	1,917,837	935,004	498,176	..	..	25,678,013
£4,000 ,, £5,000	8,037,226	7,665,069	1,857,467	1,332,665	645,721	118,999	..	..	19,657,147
£5,000 and upwards	39,939,119	32,496,228	6,254,436	9,861,430	2,650,383	881,836	..	..	92,083,432
Totals	468,944,322	401,479,466	133,522,556	122695986	52,597,000	35,814,047	835,725	342,560	1,216,231,662

6. **Numbers in each State arranged according to given limits of assets.**—In the following table are shewn the numbers of males, females and persons whose "net assets" lie between the limits shewn in the first column. These numbers have therefore no immediate relation with the arrangements according to "net incomes."

The ratio of each to the total at the bottom of the column in which it is found shews the relative distribution of persons according to ranges of assets, and, if tabulated, would reveal the degree of identity or difference between the several States and Territories of the Commonwealth. They have not been regarded as of sufficient importance to tabulate. This tabulation has been already given for the Commonwealth as a whole, however, see p. 30.

Commonwealth, States and Territories.—Number of Returns in Respect of Individuals in each Assets Group as at 30th June, 1915. (Exclusive of Absentees.)

Assets Group.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wealth.
Nil and Debt—MALES.	97,731	72,556	33,056	17,429	19,444	9,069	332	76	249,693
Under £100	209,892	150,233	76,177	48,122	29,035	19,029	491	336	533,315
£100 and under £250 ..	73,986	55,100	29,912	18,984	13,043	7,336	196	111	198,668
£250 ,, £500 ..	48,037	38,065	21,589	13,906	8,872	5,064	111	45	135,689
£500 ,, £750 ..	22,860	19,116	10,566	6,712	4,173	2,609	38	27	66,101
£750 ,, £1,000	13,595	11,877	6,298	3,968	2,457	1,505	34	12	39,746
£1,000 ,, £2,500	31,148	27,654	12,567	9,487	4,715	3,120	46	42	88,779
£2,500 ,, £5,000	14,172	12,492	3,967	4,187	1,617	1,124	19	15	37,593
£5,000 ,, £10,000	7,233	5,998	1,758	2,035	660	471	15	6	18,176
£10,000 ,, £15,000	2,248	1,620	530	525	230	158	2	..	5,313
£15,000 ,, £20,000	1,008	731	231	226	97	70	2	1	2,366
£20,000 ,, £25,000	572	393	125	108	45	39	1	..	1,283
£25,000 ,, £50,000	989	650	220	176	89	53	1	1	2,179
£50,000 ,, £75,000	295	186	63	55	24	18	..	..	641
£75,000 ,, £100,000	108	80	26	19	15	1	..	..	249
£100,000 and upwards ..	173	149	31	39	16	7	2	..	417
Totals	524,047	396,900	197,116	125,978	84,532	49,673	1,290	672	1,380,208
Nil and Debt—FEMALES.	38,078	43,122	12,607	8,221	4,682	3,291	4	31	110,036
Under £100	129,766	145,179	51,190	40,883	11,942	13,043	32	111	392,146
£100 and under £250 ..	37,494	42,242	15,445	11,159	5,498	3,971	17	20	115,846
£250 ,, £500 ..	24,260	27,951	10,119	8,172	3,873	2,370	9	18	76,772
£500 ,, £750 ..	11,629	13,162	4,485	3,854	1,680	1,078	5	2	35,895
£750 ,, £1,000	6,317	7,610	2,318	2,155	869	628	6	2	19,905
£1,000 ,, £2,500	13,369	15,699	4,181	4,296	1,438	1,342	7	4	40,336
£2,500 ,, £5,000	4,569	5,056	1,159	1,258	401	439	..	3	12,885
£5,000 ,, £10,000	1,892	1,937	517	481	164	186	5	1	5,183
£10,000 ,, £15,000	559	493	121	107	42	39	1	..	1,362
£15,000 ,, £20,000	230	179	38	49	18	14	..	2	530
£20,000 ,, £25,000	115	100	21	27	4	12	..	..	279
£25,000 ,, £50,000	167	148	34	33	10	14	..	..	406
£50,000 ,, £75,000	34	31	4	9	2	1	..	..	81
£75,000 ,, £100,000	5	16	3	2	..	..	..	..	26
£100,000 and upwards ..	25	21	..	3	..	..	..	..	49
Totals	268,509	302,946	102,242	80,709	30,623	26,428	86	194	811,737
Nil and Debt—PERSONS.	135,809	115,678	45,663	25,650	24,126	12,360	336	107	359,729
Under £100	339,658	295,412	127,367	89,005	40,977	32,072	523	447	925,461
£100 and under £250 ..	111,480	97,342	45,357	30,143	18,541	11,307	213	131	314,514
£250 ,, £500 ..	72,297	66,016	31,708	22,078	12,745	7,434	120	63	212,461
£500 ,, £750 ..	34,489	32,278	15,051	10,566	5,853	3,687	43	29	101,996
£750 ,, £1,000	19,912	19,487	8,616	6,123	3,326	2,133	40	14	59,651
£1,000 ,, £2,500	44,517	43,353	16,748	13,783	6,153	4,462	53	46	129,115
£2,500 ,, £5,000	18,741	17,548	5,126	5,445	2,018	1,563	19	18	50,478
£5,000 ,, £10,000	9,125	7,935	2,275	2,516	824	657	20	7	23,359
£10,000 ,, £15,000	2,807	2,113	651	632	272	197	3	..	6,675
£15,000 ,, £20,000	1,238	910	269	275	115	84	2	3	2,896
£20,000 ,, £25,000	687	493	146	135	49	51	1	..	1,562
£25,000 ,, £50,000	1,156	798	254	209	99	67	1	1	2,585
£50,000 ,, £75,000	329	217	67	64	26	19	..	..	722
£75,000 ,, £100,000	113	96	29	21	15	1	..	..	275
£100,000 and upwards ..	198	170	31	42	16	7	2	..	466
Totals	792,556	699,846	299,358	206,687	115,155	76,101	1,376	866	2,191,945

7. **Aggregate assets arranged according to given limits of assets.**—The numbers in the following table are the aggregates of the wealth possessed by the males, females and persons respectively shewn in the table of section 6. Like them they have no direct relation with the numbers arranged according to the magnitude of income. The ratio of each aggregate of assets for each asset-group to the total of these aggregates (at the foot of the columns) is by no means identical for each State. The ratios would shew the relative distributions according to the magnitude of the assets; they have already been given for the Commonwealth as a whole, viz., on p. 31.

Commonwealth, States and Territories.—Aggregate in Respect of Individuals of the Net Assets in each Assets Group as at 30th June, 1915. (Exclusive of Absentees.)

Assets Group.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wealth.
	£	£	£	£	£	£	£	£	£
Nil & Debt—MALES	..	..	..	..	..	..	..	..	..
Under £100 ..	6,778,032	4,657,078	2,444,176	1,596,151	995,831	618,468	18,329	11,350	17,119,415
£100 and under £250	11,847,614	8,830,654	4,839,271	3,079,976	2,093,879	1,174,189	30,433	18,258	31,914,274
£250 ,, £500	17,013,903	13,530,492	7,700,957	4,926,509	3,138,668	1,796,270	38,530	15,454	48,160,783
£500 ,, £750	13,960,232	11,667,803	6,417,081	4,060,031	2,546,251	1,590,375	23,307	17,047	40,282,127
£750 ,, £1,000	11,763,474	10,278,545	5,412,309	3,434,956	2,119,560	1,282,093	29,718	10,607	34,331,262
£1,000 ,, £2,500	49,016,305	43,615,567	19,261,233	14,806,314	7,313,256	4,856,058	67,853	64,677	139,001,263
£2,500 ,, £5,000	49,304,480	43,539,160	13,613,885	14,532,191	5,582,786	3,885,555	68,479	46,839	130,573,375
£5,000 ,, £10,000	50,189,620	41,011,274	12,033,262	14,049,889	4,545,168	3,249,174	109,218	42,331	125,229,936
£10,000 ,, £15,000	27,111,542	19,617,337	6,419,640	6,349,439	2,758,151	1,899,180	25,359	..	64,180,648
£15,000 ,, £20,000	17,323,116	12,663,937	3,956,277	3,891,761	1,647,795	1,211,844	38,578	19,210	40,752,518
£20,000 ,, £25,000	12,900,114	8,770,651	2,784,046	2,431,905	1,009,019	851,269	23,389	..	28,770,393
£25,000 ,, £50,000	33,767,772	22,207,915	7,503,094	5,937,082	3,070,483	1,830,952	28,440	25,274	74,371,012
£50,000 ,, £75,000	18,034,840	11,282,205	3,814,601	3,298,269	1,440,069	1,085,763	..	..	38,955,747
£75,000 ,, £100,000	9,312,967	6,869,864	2,250,402	1,600,566	1,267,354	78,549	..	..	21,379,702
£100,000 & upwards	33,869,847	30,770,541	4,932,586	9,682,663	2,604,134	945,712	262,259	..	83,067,742
Totals	362,193,858	289,313,023	103,382,820	93,677,702	42,132,404	26,355,451	763,892	271,047	918,090,197
Nil & Debt—FEMALES	..	..	..	..	..	..	..	..	..
Under £100 ..	3,634,119	4,033,069	1,411,486	1,114,394	411,747	365,771	1,126	3,522	10,975,234
£100 and under £250	5,967,286	6,657,064	2,455,001	1,799,626	880,499	628,814	2,812	3,230	18,394,332
£250 ,, £500	8,532,338	9,885,815	3,535,422	2,869,678	1,359,823	826,065	3,210	6,565	27,018,916
£500 ,, £750	7,022,666	7,983,301	2,671,500	2,348,016	1,013,122	653,317	3,083	1,173	21,696,178
£750 ,, £1,000	5,456,148	6,562,229	2,000,760	1,845,022	746,817	546,345	5,167	1,762	17,164,250
£1,000 ,, £2,500	20,595,997	23,923,308	6,328,154	6,505,780	2,167,529	2,072,527	9,654	6,396	61,609,345
£2,500 ,, £5,000	15,692,222	17,242,730	3,970,978	4,325,683	1,363,714	1,493,082	..	9,560	44,097,969
£5,000 ,, £10,000	12,885,951	13,260,626	3,477,867	3,282,241	1,119,086	1,271,201	36,164	8,015	35,341,151
£10,000 ,, £15,000	6,784,656	5,905,520	1,469,552	1,277,986	512,026	470,813	10,617	..	16,431,170
£15,000 ,, £20,000	4,017,648	3,073,930	661,157	842,346	314,778	250,279	..	31,290	9,191,428
£20,000 ,, £25,000	2,527,778	2,262,196	459,687	597,318	88,194	290,950	..	..	6,226,123
£25,000 ,, £50,000	5,655,295	4,904,460	1,159,987	1,167,036	363,243	521,218	..	..	13,771,239
£50,000 ,, £75,000	2,079,558	1,903,507	253,449	497,508	124,018	68,214	..	..	4,926,254
£75,000 ,, £100,000	440,459	1,357,647	284,736	158,060	..	..	..	..	2,240,902
£100,000 & upwards	5,458,343	3,211,041	..	387,590	..	..	..	..	9,056,974
Totals	106,750,464	112,166,443	30,139,736	29,018,284	10,464,596	9,458,596	71,833	71,513	298,141,465
Nil & Debt—PERSONS	..	..	..	..	..	..	..	..	..
Under £100 ..	10,412,151	8,690,147	3,855,662	2,710,545	1,407,578	984,239	19,455	14,872	28,094,649
£100 and under £250	17,814,900	15,487,718	7,294,272	4,879,602	2,974,378	1,803,003	33,245	21,488	50,308,606
£250 ,, £500	25,546,241	23,416,307	11,236,379	7,796,187	4,498,491	2,622,335	41,740	22,019	75,179,699
£500 ,, £750	20,982,898	19,651,104	9,088,581	6,408,047	3,559,373	2,243,692	26,390	18,220	61,978,305
£750 ,, £1,000	17,219,622	16,840,774	7,413,069	5,279,978	2,866,377	1,828,438	34,885	12,369	51,495,512
£1,000 ,, £2,500	69,612,302	67,538,875	25,589,387	21,312,094	9,480,785	6,928,585	77,507	71,073	200,610,608
£2,500 ,, £5,000	64,996,702	60,781,890	17,584,863	18,857,874	6,946,500	5,378,637	68,479	56,399	174,671,344
£5,000 ,, £10,000	63,075,571	54,271,900	15,511,129	17,332,130	5,664,254	4,520,375	145,382	50,346	160,571,087
£10,000 ,, £15,000	33,896,198	25,522,857	7,889,192	7,627,425	3,270,177	2,369,993	35,976	..	80,611,818
£15,000 ,, £20,000	21,340,764	15,737,867	4,617,434	4,734,107	1,962,573	1,462,123	38,578	50,500	49,943,946
£20,000 ,, £25,000	15,427,892	11,032,847	3,243,733	3,029,223	1,097,213	1,142,219	23,389	..	34,996,516
£25,000 ,, £50,000	39,423,067	27,112,375	8,663,081	7,104,118	3,433,726	2,352,170	28,440	25,274	88,142,251
£50,000 ,, £75,000	20,114,398	13,185,712	4,068,050	3,795,777	1,564,087	1,153,977	..	..	43,882,001
£75,000 ,, £100,000	9,753,426	8,227,511	2,535,138	1,758,626	1,267,354	78,549	..	..	23,620,604
£100,000 & upwards	39,328,190	33,981,582	4,932,586	10,070,253	2,604,134	945,712	262,259	..	92,124,716
Totals	468,944,322	401,479,466	133,522,556	122,695,986	52,597,000	35,814,047	835,725	342,560	1,216,231,662

8. **The average incomes, assets, and ratios of incomes to assets, States and Commonwealth.**—In the tables hereunder are given for each State and the Commonwealth, and for males, females, and persons, the average net incomes and average net assets and the ratios of the former to the latter, arranged according to given limits of income. The average incomes are necessarily very nearly similar for males, females, and persons, *i.e.*, they necessarily lie between the limiting values of the range, and usually between the middle of the range and the terminal thereof on the side of the smaller income, since in most cases the numbers diminish as the income increases. This table is important as shewing the way in which the income associated with the possession of particular amounts of wealth varies from State to State.

Commonwealth, States and Territories.—Average Net Income and Average Net Assets as at 30th June, 1915, in each Income Group, and Percentage of Income on Assets in Respect of Individuals. (Exclusive of Absentees).

MALES.

Income Group.	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.
	New South Wales.			Victoria.			Queensland.		
	£	£	%	£	£	%	£	£	%
Deficit and Nil ..	?	1,555	?	?	1,095	?	?	796	?
Under £50	29	259	11.20	28	295	9.49	30	246	12.20
£50 and under £100	75	181	41.44	74	216	34.26	74	180	41.11
£100 ,, £150	123	189	65.08	123	226	54.42	122	201	60.70
£150 ,, £156	152	239	63.60	151	300	50.33	152	253	60.08
£156 ,, £200	173	400	43.25	173	488	35.45	173	402	43.03
£200 ,, £300	237	956	24.79	237	1,056	22.44	237	788	30.08
£300 ,, £500	375	2,185	17.16	376	2,226	16.89	372	1,752	21.23
£500 ,, £750	606	4,593	13.19	600	4,211	14.25	602	3,306	18.21
£750 ,, £1,000	839	7,014	11.96	871	6,527	13.34	863	6,035	14.30
£1,000 ,, £1,500	1,209	10,895	11.10	1,222	9,395	13.01	1,214	8,766	13.85
£1,500 ,, £2,000	1,729	16,408	10.54	1,726	14,815	11.65	1,711	12,629	13.55
£2,000 ,, £3,000	2,431	24,521	9.91	2,421	22,592	10.72	2,420	19,689	12.29
£3,000 ,, £4,000	3,381	36,117	9.36	3,431	33,000	10.40	3,454	30,588	11.29
£4,000 ,, £5,000	4,502	48,370	9.31	4,472	50,068	8.93	4,493	39,453	11.39
£5,000 and upwards ..	9,961	111,020	8.97	9,281	113,145	8.20	9,561	74,783	12.78
All Groups ..	153	691	22.14	145	729	19.89	144	524	27.48
Income Group.	South Australia.			Western Australia.			Tasmania.		
	£	£	%	£	£	%	£	£	%
Deficit and Nil ..	?	1,260	?	?	802	?	?	543	?
Under £50	28	392	7.14	27	324	8.33	30	214	14.02
£50 and under £100	74	282	26.24	74	205	36.10	74	186	39.78
£100 ,, £150	122	272	44.85	124	181	68.51	121	245	49.39
£150 ,, £156	154	349	44.13	151	168	89.88	153	378	40.48
£156 ,, £200	172	585	29.40	175	241	72.61	172	619	27.79
£200 ,, £300	238	1,169	20.36	234	497	47.08	241	1,142	21.10
£300 ,, £500	372	2,623	14.18	371	1,420	26.13	378	2,527	14.96
£500 ,, £750	607	5,236	11.59	600	3,249	18.47	600	5,189	11.56
£750 ,, £1,000	854	7,104	12.02	852	5,198	16.39	838	7,336	11.42
£1,000 ,, £1,500	1,217	10,771	11.30	1,208	8,203	14.73	1,236	11,953	10.34
£1,500 ,, £2,000	1,731	15,436	11.21	1,705	12,847	13.27	1,705	17,159	9.94
£2,000 ,, £3,000	2,468	25,826	9.56	2,432	21,191	11.48	2,520	27,657	9.11
£3,000 ,, £4,000	3,471	43,439	7.99	3,438	35,962	9.56	3,214	30,678	10.48
£4,000 ,, £5,000	4,589	40,766	11.26	4,443	40,322	11.02	4,452	32,122	13.86
£5,000 and upwards ..	11,352	187,392	6.06	11,292	97,539	11.58	7,385	90,402	8.17
All Groups ..	127	744	17.07	153	498	30.72	120	531	22.60
Income Group.	Northern Territory			Federal Territory.			Commonwealth.		
	£	£	%	£	£	%	£	£	%
Deficit and Nil ..	?	2,497	?	?	222	?	?	1,170.5	?
Under £50	28	124	22.58	29	230	12.61	28.6	286.3	9.99
£50 and under £100	73	101	72.28	71	309	22.98	74.1	201.9	36.72
£100 ,, £150	120	115	104.35	119	159	74.84	122.9	209.5	58.67
£150 ,, £156	151	180	83.89	152	162	93.83	152.1	262.4	57.98
£156 ,, £200	176	171	102.92	176	256	68.75	173.0	427.9	40.43
£200 ,, £300	235	288	81.60	228	520	43.85	236.9	932.2	25.41
£300 ,, £500	367	847	43.33	369	1,919	19.23	374.4	2,123	17.64
£500 ,, £750	572	2,946	19.42	594	701	84.74	602.9	4,280	14.09
£750 ,, £1,000	918	5,710	16.08	977	8,850	11.04	854.3	6,646	12.85
£1,000 ,, £1,500	1,090	5,537	19.69	1,256	14,012	8.96	1,215	9,996	12.15
£1,500 ,, £2,000	1,514	2,584	58.59	..	..	..	1,724	15,164	11.37
£2,000 ,, £3,000	2,070	11,620	17.81	..	..	..	2,431	23,251	10.45
£3,000 ,, £4,000	..	..	..	..	..	..	3,412	34,576	9.87
£4,000 ,, £5,000	..	..	..	..	..	..	4,494	46,908	9.58
£5,000 and upwards ..	..	..	..	..	..	..	9,786	112,274	8.72
All Groups ..	153	592	25.84	141	403	34.99	146	665	21.95

Commonwealth, States and Territories.—Average Net Income and Average Net Assets as at 30th June, 1915, in each Income Group, and Percentage of Income on Assets in Respect of Individuals. (Exclusive of Absentees).

FEMALES.

Income Group.	New South Wales.			Victoria.			Queensland.		
	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.
	£	£	%	£	£	%	£	£	%
Deficit and Nil ..	?	104	?	?	127	?	?	118	?
Under £50	22	212	10.38	23	217	10.60	22	213	10.33
£50 and under £100	68	248	27.42	67	261	25.67	68	224	30.36
£100 ,, £150	118	537	21.97	118	626	18.84	118	518	22.78
£150 ,, £156	153	902	16.96	153	1,001	15.28	152	1,023	14.86
£156 ,, £200	174	1,255	13.86	174	1,405	12.38	175	1,160	15.09
£200 ,, £300	242	2,146	11.28	240	2,215	10.84	238	1,973	12.06
£300 ,, £500	376	3,745	10.04	378	3,547	10.66	380	3,187	11.92
£500 ,, £750	602	6,458	9.32	611	5,360	11.40	609	5,774	10.55
£750 ,, £1,000	852	8,500	10.02	845	7,919	10.67	842	6,688	12.59
£1,000 ,, £1,500	1,207	11,559	10.44	1,195	12,365	9.66	1,209	8,084	14.96
£1,500 ,, £2,000	1,713	14,946	11.46	1,732	15,873	10.91	1,754	9,865	17.78
£2,000 ,, £3,000	2,461	22,224	11.07	2,458	23,724	10.36	2,313	17,643	13.11
£3,000 ,, £4,000	3,592	31,676	11.34	3,493	27,099	12.89	3,484	31,033	11.23
£4,000 ,, £5,000	4,444	35,365	12.57	4,496	39,116	11.49	4,364	40,086	10.89
£5,000 and upwards ..	8,677	126975	6.83	7,046	82,746	8.52	6,327	30,201	20.95
All Groups ..	53	398	13.32	48	370	12.97	41	295	13.90

Income Group.	South Australia.			Western Australia.			Tasmania.		
	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.
	£	£	%	£	£	%	£	£	%
Deficit and Nil ..	?	102	?	?	174	?	?	84	?
Under £50	21	226	9.29	21	261	8.05	22	193	11.40
£50 and under £100	68	349	19.48	70	246	28.46	67	313	21.41
£100 ,, £150	117	735	15.92	120	380	31.58	118	766	15.40
£150 ,, £156	151	1,102	13.70	152	309	49.19	153	1,155	13.25
£156 ,, £200	175	1,635	10.70	171	682	25.07	177	1,649	10.73
£200 ,, £300	240	2,528	9.49	235	1,439	16.33	240	2,637	9.10
£300 ,, £500	381	4,013	9.49	373	3,453	10.80	383	4,143	9.24
£500 ,, £750	600	6,474	9.27	631	4,832	13.06	606	5,453	11.11
£750 ,, £1,000	849	8,051	10.55	803	9,043	8.88	853	6,628	12.87
£1,000 ,, £1,500	1,201	13,617	8.82	1,185	8,988	13.18	1,255	13,168	9.53
£1,500 ,, £2,000	1,722	19,486	8.84	1,905	12,764	14.92	1,758	26,397	6.66
£2,000 ,, £3,000	2,407	23,831	10.10	2,378	21,937	10.84	2,575	21,497	11.98
£3,000 ,, £4,000	3,532	19,551	18.01	..	..	..	3,531	3,668	9.63
£4,000 ,, £5,000	4,495	25,075	17.93	4,162	570	730.18	4,063	22,632	17.95
£5,000 and upwards ..	6,302	98,371	6.41	5,113	8,417	60.75	5,774	68,214	8.46
All Groups ..	40	360	11.11	50	342	14.62	44	358	12.29

Income Group.	Northern Territory.			Federal Territory.			Commonwealth.		
	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.
	£	£	%	£	£	%	£	£	%
Deficit and Nil ..	?	340	?	?	49	?	?	116.5	?
Under £50	22	451	4.88	19	205	9.27	22.3	216.6	10.28
£50 and under £100	77	335	22.99	66	96	68.75	67.9	260.6	26.06
£100 ,, £150	121	156	77.56	114	231	49.35	118.1	578.8	20.40
£150 ,, £156	..	..	..	..	..	..	152.8	930.3	16.43
£156 ,, £200	170	943	18.03	173	718	24.09	174.2	1,301.7	13.38
£200 ,, £300	203	193	105.18	205	3,987	5.14	240.1	2,164	11.10
£300 ,, £500	..	..	..	352	3,685	9.55	377.6	3,637	10.38
£500 ,, £750	..	..	..	..	..	..	606.8	5,890	10.30
£750 ,, £1,000	960	160	600.00	942	8,080	11.66	847.1	8,068	10.50
£1,000 ,, £1,500	1,222	6,104	20.02	1,031	15,216	6.78	1,204	11,633	10.35
£1,500 ,, £2,000	..	..	..	..	..	..	1,729	15,208	11.37
£2,000 ,, £3,000	2,066	9,817	21.05	..	..	..	2,434	22,255	10.94
£3,000 ,, £4,000	..	..	..	..	..	..	3,537	28,360	12.47
£4,000 ,, £5,000	..	..	..	..	..	..	4,455	35,634	12.50
£5,000 and upwards ..	..	..	..	..	..	..	7,627	96,829	7.88
All Groups ..	150	835	17.96	45	369	12.20	48	367	12.97

Commonwealth, States and Territories.—Average Net Income and Average Net Assets as at 30th June, 1915, in each Income Group, and Percentage of Income on Assets in Respect of Individuals. (Exclusive of Absentees).

PERSONS.

INCOME GROUP.	NEW SOUTH WALES.			VICTORIA.			QUEENSLAND.		
	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.
	£	£	%	£	£	%	£	£	%
Deficit and Nil ..	?	375	?	?	330	?	?	225	?
Under £50	25	227	11.01	24	241	9.96	25	225	11.11
£50 and under £100	73	202	36.14	71	235	30.21	73	193	37.82
£100 ,, £150	123	224	54.91	123	278	44.24	122	226	53.98
£150 ,, £156	152	287	52.96	152	367	41.42	152	289	52.60
£156 ,, £200	173	461	37.53	173	576	30.03	173	445	38.88
£200 ,, £300	237	1,067	22.21	238	1,198	19.87	237	867	27.34
£300 ,, £500	375	2,360	15.89	376	2,420	15.54	373	1,877	19.87
£500 ,, £750	605	4,846	12.48	602	4,410	13.65	603	3,577	16.86
£750 ,, £1,000	841	7,253	11.60	866	6,767	12.80	861	6,101	14.11
£1,000 ,, £1,500	1,209	11,002	10.99	1,217	9,888	12.31	1,214	8,687	13.97
£1,500 ,, £2,000	1,727	16,184	10.67	1,727	14,967	11.54	1,718	12,222	14.06
£2,000 ,, £3,000	2,435	24,238	10.05	2,428	22,809	10.64	2,405	19,395	12.40
£3,000 ,, £4,000	3,411	35,491	9.61	3,442	32,024	10.75	3,456	30,621	11.29
£4,000 ,, £5,000	4,496	47,001	9.57	4,476	48,208	9.28	4,480	39,521	11.34
£5,000 and upwards ..	9,816	112822	8.70	90,61	110157	8.23	9,234	70,275	13.14
ALL GROUPS ..	119	592	20.10	103	574	17.94	109	446	24.44

INCOME GROUP.	SOUTH AUSTRALIA.			WESTERN AUSTRALIA.			TASMANIA.		
	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.
	£	£	%	£	£	%	£	£	%
Deficit and Nil ..	?	414	?	?	419	?	?	175	?
Under £50	23	282	8.16	23	286	8.04	25	201	12.44
£50 and under £100	72	302	23.84	73	217	33.64	72	216	33.33
£100 ,, £150	121	315	38.41	124	202	61.39	121	292	41.44
£150 ,, £156	154	399	38.60	151	176	85.80	153	427	35.83
£156 ,, £200	172	663	25.94	175	263	66.54	172	711	24.19
£200 ,, £300	238	1,298	18.34	234	542	43.17	241	1,316	18.31
£300 ,, £500	373	2,808	13.28	371	1,563	23.74	378	2,742	13.79
£500 ,, £750	606	5,452	11.12	603	3,402	17.72	601	5,226	11.50
£750 ,, £1,000	854	7,256	11.77	848	5,542	15.30	840	7,228	11.62
£1,000 ,, £1,500	1,214	11,249	10.79	1,207	8,266	14.60	1,240	12,217	10.15
£1,500 ,, £2,000	1,730	16,077	10.76	1,716	12,843	13.36	1,713	18,568	9.23
£2,000 ,, £3,000	2,457	25,471	9.65	2,425	21,288	11.39	2,532	26,329	9.62
£3,000 ,, £4,000	3,480	39,955	8.71	3,438	35,962	9.56	3,249	27,676	11.74
£4,000 ,, £5,000	4,573	38,076	12.01	4,426	37,984	11.65	4,355	29,750	14.64
£5,000 and upwards ..	10,893	179299	6.08	10,866	91,393	11.89	7,224	88,184	8.19
ALL GROUPS ..	93	594	15.66	125	457	27.35	94	471	19.96

INCOME GROUP.	NORTHERN TERRITORY.			FEDERAL TERRITORY.			COMMONWEALTH.		
	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.	Average Income.	Average Assets.	Percentage of Income on Assets.
	£	£	%	£	£	%	£	£	%
Deficit and Nil ..	?	2,078	?	?	57	?	?	338.2	?
Under £50	27	117	15.25	24	217	11.06	24.3	239.3	10.17
£50 and under £100	73	109	66.97	71	283	25.09	72.0	221.8	32.48
£100 ,, £150	120	116	103.45	119	162	73.46	122.4	248.5	49.25
£150 ,, £156	151	180	83.89	152	162	93.83	152.2	310.9	48.95
£156 ,, £200	176	191	92.15	176	271	64.94	173.1	493.1	35.10
£200 ,, £300	235	287	81.88	228	585	38.97	237.2	1,047.7	22.64
£300 ,, £500	367	847	43.33	367	2,048	17.92	374.8	2,303	16.28
£500 ,, £750	572	2,946	19.42	594	701	84.74	603.5	4,512	13.37
£750 ,, £1,000	925	4,785	19.33	954	8,336	11.44	853.2	6,864	12.43
£1,000 ,, £1,500	1,128	5,699	19.79	1,181	14,413	8.19	1,213	10,250	11.84
£1,500 ,, £2,000	1,514	2,584	58.59	..	..	..	1,725	15,170	11.37
£2,000 ,, £3,000	2,068	10,847	19.07	..	..	..	2,431	23,095	10.53
£3,000 ,, £4,000	..	..	..	..	..	..	3,429	33,742	10.16
£4,000 ,, £5,000	..	..	..	..	..	..	4,489	45,398	9.89
£5,000 and upwards ..	..	..	..	..	..	..	9,563	110677	8.64
ALL GROUPS ..	153	607	25.21	119	396	30.05	110	555	19.75

Ratio of Net Income to Net Assets Associated therewith. Commonwealth, 1915.

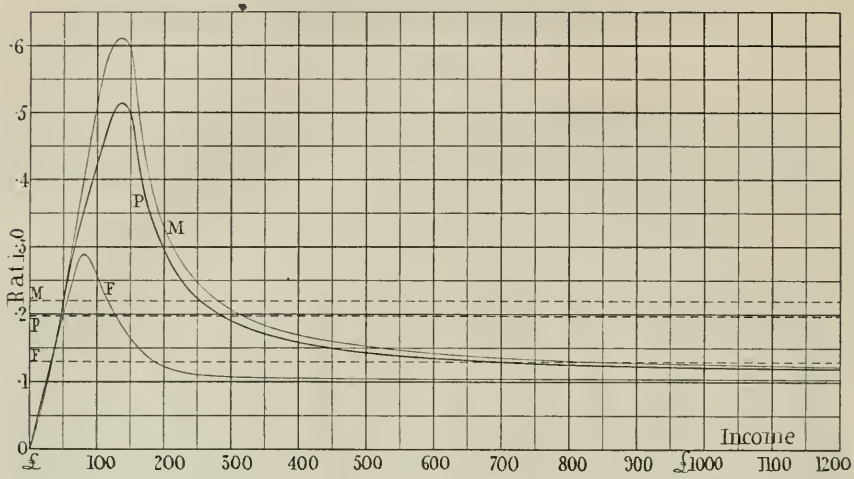


Fig. 1.

Fig. 1 furnishes a representation of the ratio which the net incomes of any given size bears to the net assets which, on the average, are associated therewith. The base line indicates net income, while the ordinates to the curves denote for any given net income the ratio which such income bears to the average net assets associated therewith. The curve marked M relates to males, that marked F to females, while the intermediate curve marked P relates to the sexes combined. The dotted horizontal line marked M represents the average ratio of net income to net assets, that marked F furnishes a similar representation for females, and that marked P for the sexes combined. The contiguity and similarity of the curves for persons and for males are due to the marked preponderance in the number of the returns for males.

9. **The significance of income as related to assets.**—The last three tables of section 8 shew that for males and females in all the States the percentage of income on assets increases rapidly with increasing income to a certain point, and thereafter diminishes. Amongst males this maximum is reached in the income group "£150 and under £156" in the cases of Western Australia and the Federal Territory, and in the income group " £100 and under £150" in all the other States, in the Northern Territory, and in the Commonwealth treated as a whole. Amongst females the maximum percentage occurs in the income group " £50 and under £100" in all the States except Western Australia, in the Federal Territory, and in the Commonwealth as a whole. In Western Australia the female maximum occurs in the group £150-£156, if the abnormal result in the two highest groups be ignored, while owing to smallness of numbers the Northern Territory figures vary irregularly. The position of the maximum for the sexes combined agrees with that for males, except in the case of South Australia, where the maximum occurs in the £150-£156 group instead of the £100-£150 group. This variation is evidently due in large measure to the fact that incomes between the ranges of £50 and £300 amongst males and between £50

and £150 amongst females are very largely *derived from personal exertion*. It may be noted in this connection that 80 per cent. of the male returns received, and 69 per cent. of the male income recorded, lie between the income limits of £50 and £300.

Incomes below £50 and above £300 are much more largely derived from property than is the case with the incomes mentioned above, and consequently in these cases the percentages obtained approach more nearly to the rates of profit derivable from the investment of capital. Probably in no class is the personal element entirely eliminated, and hence all the percentages shewn will probably exhibit an advance on normal rates of profit. For incomes above £500 the percentage for males for the whole Commonwealth varies from 14.09 per cent. to 8.72 per cent., while in the similar field for females the variation is between 12.50 per cent. and 7.88 per cent.

10. **Comparison with other countries.**—A complete comparison of the distribution of incomes and wealth between Australia and any other country is not possible, since the necessary information has not—as far as is known—been collected and tabulated. Some idea, however, can be had of the relative positions between Prussia in 1911, and Australia in 1914-5, as regards wealth and associated income.

The Statistical Year-books for Prussia, containing returns relating to the Prussian Income Tax and Property Tax, furnish the values of incomes and of property. The 1912 volume gives incomes said to be for the year 1912, and the 1913 volume amplifies the values of property, said to be for 1911, which are commenced in the 1912 volume. It appears, however, from a table on page 301, that, so far as the Property Tax is concerned, an assessment is made once in three years. There are figures for the individual years 1905 and 1906, but subsequent figures relate to the periods 1899-1901, 1902-04, 1905-07, 1908-10, and 1911-13. It may, therefore, be reasonably assumed that the Property Tax Returns (said to be for 1911) can be applied to either of the three years 1911, 1912, or 1913, and that they refer to the same population as the Income Tax Returns (said to be for the year 1912).

The income figures are given for six large groups subdivided into a large number of smaller groups, rising by £15 up to £225, then by £25 to £475, and then by £50, £75, and £100 to £5000, etc., etc. The property figures are given for eight large groups subdivided into a large number of smaller groups, rising by £100 up to £1200, then by £200 up to £3000, then by £500 to £10,000, by £1000 to £50,000, and afterwards by larger amounts.

It may also reasonably be assumed that the 1,767,034 persons with property exceeding £300 are contained in the 6,906,497 persons with incomes exceeding £45, but, apart from the fact that it is a fair assumption that the four persons with the largest incomes (total £2,152,500) are the same four persons who are possessed of the largest properties (total £42,599,000), it cannot be assumed that the persons in any one group of incomes wholly correspond to the persons in any group of property, and certainly as the incomes become smaller this observation more and more strongly applies.

In the table hereunder the results are compiled according to the range of income shewn in column (ii.), the corresponding number of persons being shewn in column (i.). For the wealth possessed by identical numbers of persons, the aggregates were made up from the bottom of column (i.), the corresponding aggregates of wealth being shewn in column (v.). This enabled the average income and average wealth of *each class* to be ascertained. As already stated, the individual persons in column (i.) are not the same for the wealth aggregates as for the income aggregates, that is, they are identical numbers of persons, but are *not identical persons*, and probably the non-identity as to persons greatly increases for the larger numbers (in the higher parts of the table). Hence the ratio of the averages does not represent the ratio of the income accruing to the groups of persons possessing given aggregates of wealth.

The table is nevertheless of value as shewing independently the average incomes enjoyed and average wealth possessed by separate groups of equal numbers of people more or less differently constituted as regards the individual incomes and the individual aggregates of wealth.

The results in the final column (ix.) are deduced in a similar way from Australian data, and, being made up in the same way, furnish a very fair basis of comparison.

Prussian Wealth and Income Returns for 1911.

Persons. (i.)	Range of Incomes. (ii.) £	Aggregate Income. (iii.) £1,000	Range of Wealth. (iv.) £	Aggregate Wealth. (v.) £1,000	Average Income. (vi.) (iii.)÷ (i.) £	Average Wealth. (vii.) £	Ratio of Averages.§ × 100. (viii.)	Australian Ratio. × 100 (ix.).
635,191	Exempt	*28,584	Exempt‡	157,365	45 ?	650	?	..
8,158,425	less than 45 †	183,575	(242,136)	..	22.5	..	..	..
2,551,196	45–60	133,256	300–570	..	52.2	419	?	..
2,656 395	60–90	192,978	(338,782)	142,108	72.6	..	..	..
644,197	90–120	66,763	..	..	103.6	..	..	..
270,833	120–150	36,182	570–920	183,405	133.6	677	19.73	..
254,226	150–180	41,238	920–1,720	342,676	162.2	1,348	12.03	..
121,671	180–210	23,677	1,720–2,200	233,784	194.6	1,921	10.14	..
101,921	210–250	23,222	2,200–2,850	255,598	228	2,508	9.09	..
69,830	250–300	19,086	2,850–3,600	230,510	273	3,301	8.27	..
44,259	300–350	14,371	3,600–4,300	173,175	325	3,913	8.30	}
34,433	350–400	12,886	4,300–5,050	154,999	374	4,501	8.31	} 11.10
24,127	400–450	10,225	5,050–5,800	125,889	424	5,218	8.13	}
17,610	450–500	8,470	5,800–6,600	114,132	481	6,481	7.42	}
25,441	500–600	13,777	6,600–8,150	186,785	542	7,342	7.38	} 9.40
16,995	600–700	11,044	8,150–9,700	147,778	650	8,695	7.25	}
12,347	700–800	9,236	9,700–11,400	133,796	748	10,836	6.90	}
8,829	800–900	7,507	11,400–12,900	102,519	850	11,612	7.32	} 9.05
7,026	900–1,000	6,651	12,900–14,600	97,703	947	13.906	6.81	}
9,635	1,000–1,200	10,529	14,600–17,800	155,245	1,093	16,113	6.79	}
6,714	1,200–1,400	8,689	17,800–21,050	129,806	1,294	19,334	6.69	} 8.51
5,073	1,400–1,600	7,589	21,050–24,600	114,510	1,496	22,572	6.63	}
3,562	1,600–1,800	6,049	24,600–27,900	94,405	1,698	26,503	6.41	} 8.18
2,792	1,800–2,000	5,298	27,900–31,500	82,193	1,898	29,439	6.45	}
4,809	2,000–2,500	10,711	31,500–40,050	169,571	2,227	35,261	6.32	} 7.71
2,807	2,500–3,000	7,680	40,050–48,900	124,347	2,736	44,299	6.18	}
3,441	3,000–4,000	11,849	48,900–66,000	187,773	3,444	54,569	6.31	7.54
1,871	4,000–5,000	8,341	66,000–84,000	139,801	4,458	74,750	5.96	7.21
3,003	5,000–10,000	20,381	84,000–175,000	348,861	6,788	116.171	5.84	}
1,003	10,000–20,000	13,635	175,000–371,000	265,779	13,595	264,984	5.13	}
329	20,000–40,000	8,162	371,000–769,000	156,365	24,810	475,275	5.22	} 6.50
88	40,000–100,000	5,282	769,000–1,500,000	92,469	60,028	1,050,790	5.71	}
30	100,000–200,000	4,071	1,500,000–5,000,000	72,881	135,717	2,429,367	5.59	}
4	200,000 and over	2,165	5,000,000 and over	42,599	541,312	10,649,750	5.08	}

* Computed on the basis of an average of £45. † Computed on the basis of an average of £22 10s.
‡ There are 242,136 exempt estates. § Ratio of (vi.) to (vii.) multiplied by 100, that is, the ratio of the income to the wealth for equal numbers in each group reckoning from the highest.

The table hereunder is similarly compiled for Australia; the corresponding ratios being shewn in column (vii.), and those for Prussia in column (viii.).

It will be noticed that the ratios are invariably higher in Australia; that is, the incomes are larger in relation to the wealth possessed than they are in Prussia.

Commonwealth of Australia.—Wealth and Income Returns for 30th June, 1915.

Persons. (i.)	Range of Incomes. (ii.)	Aggregate Income. (iii.)	Aggregate Wealth. (iv.)	Average Income. (v.)	Average Wealth. (vi.)	Australian Ratio of Averages × 100. (vii.)	Prussian Ratio of Averages × 100 (viii.)
	£ £	£	£	£	£	£	
315,936	..	..	..	..	..	..	..
447,105	–50	10,880,401	3,150,376	24.3	7.05	345	..
495,941	50–100	35,724,563	22,136,718	72.0	44.6	161	..
501,124	100–150	61,340,433	105,284,414	122.4	210.1	58.3	..
50,281	150–156	76,650,694	22,139,598	152.2	440.3	34.6	19.77
170,047	156–200	29,430,745	121,383,220	173.1	713.8	24.25	
117,325	200–300	27,831,753	180,919,291	237.2	1,542.0	15.38	8.77
55,725	300–500	20,886,545	187,734,822	374.8	368.9	11.10	7.97
18,619	500–750	11,236,341	119,482,772	603.5	417.3	9.40	7.30
7,458	750–1,000	6,362,835	70,317,835	853.2	9,428.5	9.05	7.02
5,838	1,000–1,500	7,082,712	83,243,494	1,213	14,259	8.51	6.71
2,496	1,500–2,000	4,305,861	52,629,640	1,725	21,086	8.18	6.46
2,024	2,000–3,000	4,920,900	63,820,669	2,431	31,532	7.71	6.24
761	3,000–4,000	2,609,510	34,608,233	3,429	45,477	7.54	7.54
433	4,000–5,000	1,943,667	26,951,453	4,489	62,244	7.21	5.96
832	5,000 & over	7,956,244	122,429,217	9,563	147,151	6.50	5.22

11. **Income—assets relation of partnerships and companies.**—Particulars in respect of the net assets of partnerships and companies in each income group are furnished in the next table. Absentee partnerships are excluded from this return, as are also absentee and Life Assurance Companies.

Comparison in Income Groups of Average Net Income and Average Net Assets of Australian Partnerships and Companies as at 30th June, 1915.

INCOME GROUP.	PARTNERSHIPS. (Exclusive of Absentee Partnerships.)					COMPANIES. (Exclusive of Absentee and Life Assurance Companies.)				
	Aggregate Net Income for 12 mths. ended 30/6/15.	Aggregate Net Assets at 30/6/15.	Aver. Net Income for 12 mths. ended 30/6/15.	Aver. Net Assets at 30/6/15.	Percentage of Income on Assets.	Aggregate Net Income for 12 mths. ended 30/6/15.	Aggregate Net Assets at 30/6/15.	Aver. Net Income for 12 mths. ended 30/6/15.	Aver. Net Assets at 30/6/15.	Percentage of Income on Assets.
	£	£	£	£	%	£	£	£	£	%
Deficit and nil ..	..	13,571,815	..	5,842	..	..	23,340,458	..	10,309	..
Under £50	25,614	1,088,904	26	1,099	2.35	6,022	878,433	20	2,978	.69
£50 and under £100	70,667	1,402,929	74	1,466	5.04	13,109	916,742	72	5,037	1.43
£100 ,, £150	113,082	1,494,020	123	1,626	7.57	19,704	1,035,083	123	6,469	1.90
£150 ,, £200	140,510	1,408,829	173	1,737	9.97	22,916	1,068,277	171	7,972	2.15
£200 ,, £300	373,397	2,725,488	248	1,809	13.70	57,882	1,648,529	246	7,015	3.51
£300 ,, £500	788,032	5,409,186	385	2,642	14.57	135,327	2,722,458	397	7,984	4.97
£500 ,, £750	737,301	5,064,838	605	4,158	14.56	177,237	2,860,247	624	10,071	6.20
£750 ,, £1000	541,263	3,502,262	865	5,595	15.45	175,061	2,205,121	867	10,916	7.94
£1000 ,, £1500	854,767	5,273,288	1,214	7,490	16.21	405,934	5,189,701	1,245	15,919	7.82
£1500 ,, £2000	558,610	3,478,657	1,719	10,704	16.06	369,765	4,690,867	1,736	22,023	7.88
£2000 ,, £3000	892,165	5,951,397	2,405	16,042	14.99	675,248	8,334,512	2,447	30,198	8.10
£3000 ,, £4000	540,441	3,864,731	3,464	24,774	13.98	633,761	6,993,659	3,501	38,639	9.06
£4000 ,, £5000	438,357	3,266,533	4,428	32,995	13.42	628,380	7,042,486	4,488	50,303	8.92
£5000 and upwards	3,349,460	22,474,336	11,752	78,857	14.90	18 945,763	199 979,999	24,289	256,385	9.47
All Groups ..	9,423,666	79,977,213	706	5,996	11.78	22,266,109	268,906,572	3,703	44,721	8.28

CHAPTER II.—THE WEALTH AND INCOME SURFACE.

1. **Correlation of income and assets.**—Reference has already been made to the association of income and wealth in the Australian and in the Prussian returns. This association will now be further considered. If, for each income-group and its associated asset-group, the number of persons be ascertained ; and if, moreover, the ranges of income are the same throughout, and the ranges of asset are also the same throughout (the two not necessarily being equal), these numbers can be represented as a system of parallelepipeds on the double-ranges as basic areas. They thus form a species of "stepped" surface, which, when the ranges of income and asset are both made indefinitely small, becomes a continuous or smooth surface. We shall consider the nature of this surface.

In order to fully exhibit the correlation of income and asset, and consequently to fully appreciate the significance of the tables of Chapter I. of this part, section 1, it is necessary to ascertain the (average) frequency with which a given amount of wealth is associated with a given income. Since for a given income the numbers (N) included in small ranges of wealth vary (sensibly) as the ranges—and the same observation applies also when, for a given amount of wealth incomes are considered, it follows that the number of persons in each double-entry range must be divided by the product of the corresponding range of wealth and range of income, in order to exhibit the comparable frequencies. The quotient is the average per square unit (wealth by income) throughout the double range (roughly at the common centre of the two ranges). Or since $\delta N \propto \delta x$, and as δy, therefore as $\delta x \delta y$, we shall have for the vertical height z.

$$(1) \ldots\ldots z = \delta N / (\delta x \delta y) ; \text{ or } z_a = N_{bc,pq} / (x_c - x_b)(y_q - y_p),$$

in which expression b and c are the limits of the range of wealth, say, and p and q are those of the range of income for the number of persons N. Obviously $z = f(x, y)$, and if we can ascertain this function, we shall be able to determine the values for any ranges whatsoever, since

$$(2) \ldots\ldots N_{bc,pq} / P = \zeta = \int_b^c \int_p^q f(x, y)\, dx\, dy,$$

in which the absolute number N is the number between the ranges bc and pq in question, and ζ denotes the proportion of this to the population P. In this case the value of the double-integral between the widest possible limits is taken as unity.

The data from which the wealth-and-income surface can be deduced is shewn in the following tables, which give the number of males and females respectively, out of a recorded total of 1,380,208 males, and 811,737 females, whose incomes and whose assets each range through £1 sterling at a position approximately at the centre of the several ranges. In order to reduce the number of decimals to be expressed, the quantities found by dividing the product of each range of income by the range of the corresponding asset have all been multiplied by 1000. The tabular quantities therefore are 1000 times the average taken over each range of income and its associated range of asset.[1] I shall call this surface the *plutoprosodic surface.*[2] It is not very regular, but can be defined with considerable precision.

1. Instead of regarding these quantities as referable to the centres of the ranges, in order to define the continuous wealth-and-income (plutoprosodic) surface, the result will be more satisfactory, but not quite correct if referred to the average values of income and average values of asset. The labour of applying necessarily small corrections to these results in order to make them rigorously accurate, is not justified, in view of the various limitations of the data, see figures 2 and 3, page 66, shewing the surface. If the quantities in the table are divided by 1,000, they give the numbers of males and females who are included on the average in a range of x to $x+1$ pounds sterling income, and y to $y+1$ pounds sterling wealth ; the average extending all over the double-range X_1 to X_2 and Y_1 to Y_2.

2. From πλοῦτος, wealth, and πρόσοδος, income as opposed to principal, or προσοδικός, appertaining to income.

Frequency, multiplied by 1000, per unit of Range (Pound Sterling) of Wealth and Income, i.e., 1000 times the Number of Persons of a given Range of Wealth and a given Range of Income divided by the Product of the Range of Wealth into the corresponding Range of Income. Australia, 30th June, 1915.

Range.	Aver. Value of Income.	Under 100.	100–250.	250–500.	500–750.	750–1,000	1,000–2,500	2,500–5,000	5,000–10,000	10,000–15,000.	15,000–20,000.	20,000–25,000.	25,000–50,000.	50,000 75,000.	75,000–100,000
MALES—															
Under 50	28.6	11396	2546	1179	601	352	100	15	2.19	.328	.080	.052	.0100	.0008	..
50–100	74.1	30222	5011	1869	860	488	167	23	2.59	.472	.150	.048	.0100	.0024	..
100–150	122.9	41151	9339	3022	1187	621	193	36	3.62	.564	.160	.056	.0150	.0024	.00160
150–200	168.2	13887	5466	2265	1030	559	169	35	4.62	.670	.180	.073	.0160	.0040	.00080
200–300	236.9	1809	1225	702	430	282	110	27	5.49	.750	.192	.080	0130	0024	.00040
300–500	374.4	158.5	148	123	91	75	40	15	4.07	.915	.258	.089	.0150	.0038	.00060
500–750	602.9	15.64	16.61	16.7	15	14	9.81	5.45	2.26	.824	.309	.106	.0203	.0023	.00080
750–1000	854.3	3.04	3.360	4.24	4.09	3.70	2.87	2.03	1.16	.520	.252	.144	.0243	.0018	.00120
1000–1500	1215	.640	1.066	.832	.990	.780	.850	.695	.471	.259	.161	.104	.0278	.0037	.00050
1500–2000	1724	.260	.293	.344	.230	.250	.240	.187	.179	.129	.093	.058	.0252	.0046	.00130
2000–3000	2431	.030	.073	.076	.084	.056	.0480	.0440	.0516	.0512	.042	.028	.0161	.0050	.00100
3000–4000	3412	..	.013	.012	.040	.012	.0130	.00880	.0104	.0106	.016	.013	.0084	.0042	.00110
4000–5000	4494	.010	.007	.004	..	.008	.0080	.00640	.0048	.0044	.006	.008	.0042	.0020	.00130
Over 5000	9786	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Average asset Males ..	..	32.10	160.6	354.9	609.4	863.7	1565.7	3473.3	6889.8	12079.9	17224.2	22424.3	34130.8	60773.3	85862.2
FEMALES—															
Under 50	22.3	2091	6717	3434	1636	798	136	6.09	.57	.096	.028	.008	.0020	.00400	..
50–100	67.9	15707	2009	839	489	366	185	13.09	.77	.052	.032	.012	.0030	.00400	..
100–150	118.1	3934	966	426	223	149	89	25.40	1.07	.100	.028	..	.0020	..	..
150–200	169.4	617	311	152	96	66	39	20.35	1.84	.100	.028	.020	.0080	..	..
200–300	240.1	99	74	45	34	22	49	8.97	2.58	.172	.038	.016	.0028	.00080	.00040
300–500	377.6	16	14	10	7.36	6.70	4.28	2.31	1.58	.329	.038	.017	.0038	.00040	..
500–750	606.8	2.9	3.04	2.27	2.11	.187	1.18	.657	.415	.317	.107	.038	.0034	.00080	..
750–1000	847.1	1.0	.90	.416	.65	.640	.442	.244	.155	.143	.101	.049	.0044	.00010	..
1000–1500	1204	.26	.17	.017	.23	.24	.134	.086	.065	.048	.041	.027	.0082	.00030	.00010
1500–2000	1729	.02	.026	.036	.040	.096	.041	.026	.025	.017	.0128	.011	.0056	.00060	..
2000–3000	2434	.06	.028	.016	.016	.012	.013	.013	.010	.0078	.0034	.0034	.00308	.00104	.00020
3000–4000	3537	..	..	004	.016	.008	.003	.003	.003	.0016	.0016	.0001	.00104	.00028	.00016
4000–5000	4455	..	..	..	..	..	..	.002	.012	.0008	.0001	.0001	.00044	.00040	.00024
Over 5000	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Average asset Females ..	..	27.98	158.7	351.9	604.4	682.3	1527.4	3422.0	6818.6	12064.0	17342.0	22316.0	33919.3	60817.9	86188.4
Persons	..	30.35	159.9	353.8	607.6	863.2	1553.7	3460.3	6874.0	12077	17246	22405	34098	60778	85893

Note.—The frequency for persons is the sum of the two values above.

3. **The graphs of the plutoprosodic (or wealth-and-income) surfaces.**—The upper graph represents the plutoprosodic surface for males, and the lower graph the plutoprosodic surface for females, by means of contours shewing the number per square unit (multiplied by 1000), possessed of any given income and any given wealth. Thus, if any contour be followed, say 10, on the graph for males, a succession of points taken thereon shews the wealth and incomes associated with that degree of frequency, while if a succession of points taken on contour 20 be followed, the frequency will be double. Thus wealth £3000 associated with incomes of £495 occur as frequently in Australia as wealth £5000 associated with incomes of £266, and both occur with half the frequency with which wealth amounting to £2500 is associated with incomes of £412.

The numbers for the curves marked *a*.....*i* are as follows :—

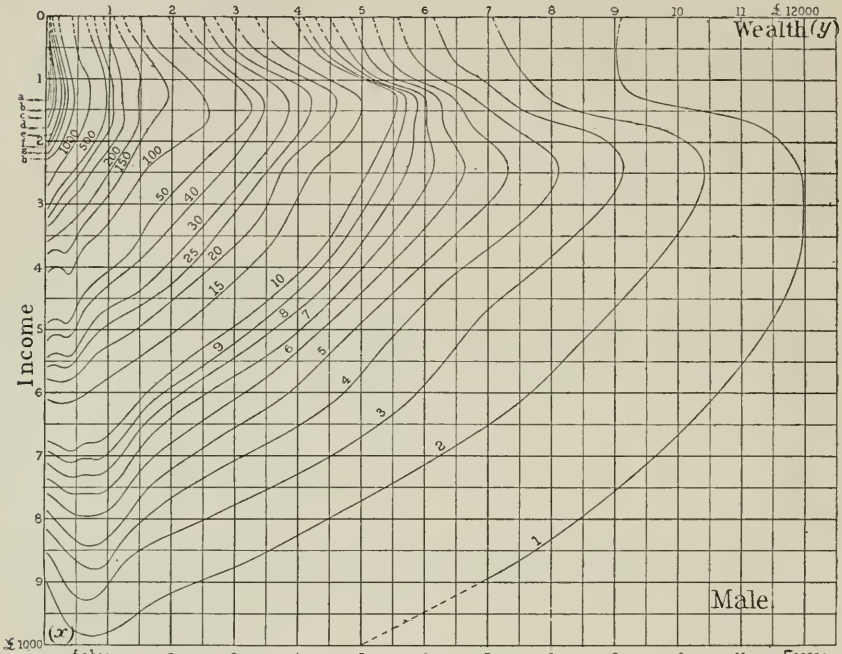
Letter	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*
Male	35,000	20,000	15,000	10,000	5,000	4,000	3,000	2,000	
Female	20,000	15,000	10,000	5,000	4,000	3,000	2,000	1,500	1,000

The immense advantage which the graph possesses as compared with tabular results is obvious from the above illustration of its interpretation : it is only by means of the contours of the plutoprosodic surface that the way in which wealth and income are associated in any community can be completely defined.

4. **Frequency according to income and wealth.**—In order to observe the change of frequency for any given income, the co-ordinate value is taken on the left hand vertical line, and the intersection with the contours of the horizontal line with this value gives the relative frequency according to the wealth corresponding.

Similarly, for any given amount of wealth the co-ordinate value is taken on the top horizontal line, and the intersection with the contours of the vertical line with this value gives the relative frequency according to the income corresponding.

Fig. 2. **Plutoprosodic Surface (Males).**



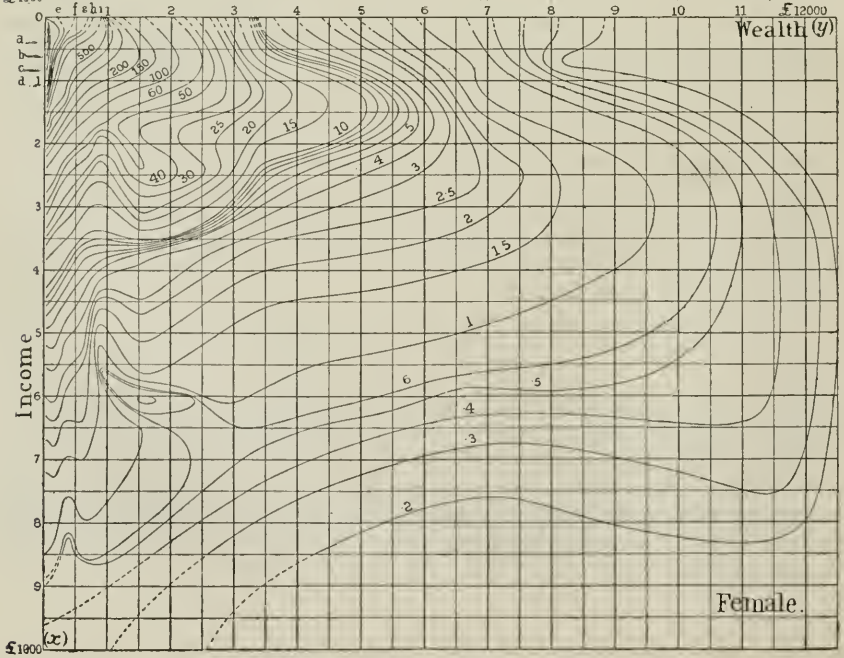


Fig. 3. **Plutoprosodic Surface (Females).**

The upper figure (1) shews the contours of the plutoprosodic surface for males, based upon 1,380,208 War Census returns for males, and the lower figure (2) the plutoprosodic surface for females, based upon 811,737 War Census returns for females. The frequencies indicating vertical heights are as shewn by figures written on the contour lines. These denote the number of persons in the totals considered, multiplied by 1000, for a range of £1 of wealth and £1 of income. The intersection of the vertical lines with the contours shews the frequency with variations of income for given values of wealth. Similarly, the intersections of the horizontal lines with the contours shew the frequency for given incomes with variations of the amount of wealth.

Where the ranges of wealth or income, or both, are more extended than one pound sterling, the frequency numbers should be multiplied by the product of the two ranges and divided by 1000. Thus, if the range of wealth be from £7000 to £7500, and that of income from £500 to £510, the multiplier will be $500 \times 10 = 5000$. This divided by 1000 gives 5, the factor to be multiplied into the frequency value as shewn. It will be sufficiently accurate to adopt the value of the contour passing through the centre of the range-area in question. For males this is approximately 2.45; the required frequency is therefore 12.25: similarly for females, and with the same double range, the required frequency will be $0.864 \times 5 = 4.32$.

It will be observed that the surface for males is fairly regular, but that for females is very irregular. The irregularities are probably accidental, and with larger numbers would most likely disappear.

The values of curves a..... *i* have been referred to in the preceding paragraph.

The plutoprosodic surface, it will be seen, represents the whole system of relations that exist between wealth and income, by means of a three dimensional figure on which the contours are the intersections of planes parallel to the base at the successive heights indicated by the figures.

PART V.

THE ESTIMATION OF WEALTH FROM PROBATE RETURNS.

CHAPTER I.—THE INTERVAL OF DEVOLUTION.

1. **The interval of devolution method.**—The method of determining the aggregate of private wealth from the aggregate amount appearing as inheritance, by taking account of the *average interval* between the inheritance and the passing on of an estate, or the average interval between " successions to title," is known as the " interval of devolution" method. It is a method that has been used more frequently than any other. We shall consequently refer to it at some length, and may point out that it has recently been discussed by Mallet,[1] and very fully and more recently by Corrado Gini.[2]

In this method, as employed by Mony, 1877, and by Bailleux de Marisy, 1878, it was assumed that the mean duration of life could be regarded as the devolution interval. Ten years later Verrijn Stuart, viz., in 1888, made the same assumption, as also did F .S. Nitti quite recently,[3] viz., in 1904. In December, 1878, L. Vacher pointed out that the devolution-interval should be the arithmetic mean between the times when persons receive, and when they transmit to their heirs, their inheritances.

This suggested the idea that a fundamental period to be ascertained was the "duration of a generation" determined as the interval between the births of parents and children, but it was demonstrated by Coletti that increase in the duration of life could sensibly disturb the coincidence of the interval between the births and that between the deaths. It was simultaneously pointed out by Gini, and by Lavergne and Henry, 1908, that there is a sensible difference between the interval from the deaths of parents to the deaths of children, and the interval between the deaths of testators and the deaths of their heirs ; in fact, that the latter interval is appreciably shorter owing to the influence of " successions" by collateral relatives, the widowed, and 'strangers in blood.' Mallet, in 1908, ascertained the devolution-interval by computing the mean duration of the life of heirs by means of life-tables. In 1909, March indicated another method based upon the difference in the mean age of testators and the mean age of their heirs (*intervalle moyen des mutations successives*).

It was not long before it was perceived that the amount of the " succession" was of importance in forming the " average interval." Mony, Bailleux de Marisy and Vacher took cognisance of this, and de Foville shewed that it is also necessary to add the amount of settlements (*donazioni*), which are, of course, virtually anticipations of inheritance.

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1. Journal Roy. Stat. Soc., lxxi., pp. 65-84, 1908.

2. L'Ammontare e la Composizione della Ricchezza delle Nazioni), 1914, Torino, pp. 712, *vide* pp. 50-132.

3. See bibliography appended hereto.

Gini shewed that the interval between two settlements was sensibly equal to the interval between two successions. Attempts to evade the payment of duty reduce the amount coming into evidence, and Vacher endeavoured accordingly to ascertain the magnitude of the evasions, with the result that he—and others also—found that the ascertained amounts did not agree with the estimations made by officials of various departments of Finance. In the attempt to obtain a multiplier from the average devolution-interval for individual estates, Gini pointed out that the arithmetic mean is unsatisfactory, and that the harmonic mean should be used; and further, that many estates are ceded by persons of advanced age against service to be rendered to them or their descendants; and yet again, that it is very important that account should be taken of the influence on the annual amount of devolution of variations in the wealth of a country. No method is quite free from this difficulty.

2. **Determination of the interval of devolution.**—The duration of a generation, regarded as the interval between two successive generations, was determined *directly* by Turquan. Using 4½ million schedules, he computed that from years 1892 to 1896 the average age of fathers of "legitimates" (so-called) in France, was 33 years 7 months, and that of mothers of "legitimates" 29 years 10 months 13 days. In the following table the results are given for a number of countries, as well as the period to which these dates apply :—

Average Duration of a Generation.

Country.	Period.	Average.		Authority.
		Fathers of (so-called) "Legitimates."	Mothers of (so-called) "Legitimates."	
France	1892-96	33.6	29.9	Turquan
,, ...	1892-1900	..	29.33	International Statistics*
Paris	1903-05	32.4	28.1	Gini
Rome	1894-96	36.5	29.6	Raseri
Udine	1872-82	34.0	30.5	Raseri
Tasmania	1904	33.68	29.05	Gini
New South Wales	1904	34.1	29.7	Gini
,, ,,	1893-1900	..	29.55	International Statistics*
Finland	1881-85	..	31.53	do.
,, ...	1886-90	..	31.63	do.
,, ...	1891-1900	..	31.14	do.
Sweden	1871-80	..	32.63	do.
,, ...	1881-90	..	32.27	do.
,, ...	1891-1900	..	32.22	do.
Denmark	1880-84	..	31.37	do.
,, ...	1885-89	..	31.33	do.
,, ...	1890-94	..	31.37	do.
,, ...	1895-1900	..	30.40	do.

* Published in the Statistique générale de la France.

The preceding examples may be called instances of determination by the *direct* method. Rümolin appears to have been the first to adopt an *indirect* method. In this the mean ages of the persons marrying are ascertained, and the interval between marriage and the birth of the first child, and half the mean interval between the birth of the first and last child. In this way the interval between the births of the parents

and that of the middle child is presumed to be sufficiently well ascertained. Rümelin found the interval between marriage and the birth of the first child to be one year ; between the births of first and last child 12.2 to 12.5 years ; and thus the interval between marriage and the birth of the middle child to be slightly over 7 years. By this method he calculated the average interval between the births of parents and of children to be as follows :—Germany, 36.5 ; England, 35.5 ; France, 34.5 years. This method is, of course, not accurate, because the interval between marriage and the birth of the first child cannot be regarded as exactly one year. Four years' experience in Australia, for example, gives the result 1.19 years, and shews that the interval varies with the age of the parent (in this case the mother), the result being as follows :—

Interval between Marriage and Birth of First Child, Australia, 1908-1911.

Ages of Mother	Under 20	20-24	25-29	30-34	35-39	40-44	45 & over	All Mothers
Interval from Marriage to Birth of First Child ..	0.63	0.97	1.44	2.02	2.70	3.36	2.97	1.19

Again the children do not follow at equal intervals, and there is little doubt that the interval differs somewhat in different countries.

Vacher adopted an indirect method, which may be described as follows :— Let n equal the number of births occurring in the ith year after marriage. Then the sum of the products ni divided by the total births gives the average interval between marriage and the birth of all children, *i.e.* :—

$$(1)\ldots\ldots i_0 = \Sigma(ni) / \Sigma n$$

This average interval i_0 added to the average age of persons marrying gives the interval between the birth of parents and births of all children. In this way Vacher found 33.06 for France in 1880. It has been wrongly assumed that the methods are equivalent ;. they give, however, sensibly different results. The character of these methods was discussed by Gini, who makes the following observations :—" With Vacher's and Rümelin's methods the interval between births of parents and children is not accurately ascertained, but the method gives the interval between the births of all persons marrying, whether prolific or not, and the births of the children. Since the non-prolific marrying are as a rule older than the prolific, the interval between the births of parents and children computed by this method is too large. Moreover, even prolific parents enter into the results in a different way by the various methods. In the method of Turquan, a parent is taken account of in the computation each time he has a child, whereas in Rümelin's method the parent enters once only. Moreover, as more prolific parents are ordinarily younger, Rümelin's method will give a higher interval than Turquan's. Vacher's method gives a still higher figure than Rümelin's, since each parent, though he appears but once in the calculation of the age of persons marrying, nevertheless appears as many times in the calculation of the interval between marriage and birth as he has children : and further, the parents who have more children show a larger interval between the birth of the parent and the birth of the middle child. Gini gives an instructive example, which may be here reproduced as illustrative of the significance of the difference of the methods.

Example.—Let there be 3 families, in which, in the period 1890-1900, 7 children were born, viz., 5 as issue of a father born in 1870 and married in 1889, born in the years 1890, 1891, 1893, 1897, 1900; 2, as issue of a father born in 1861 and married in 1890, born in the years 1893 and 1895. The third husband, born in 1850 and married in 1889, let it be supposed has no issue.

(*a*) *Method of Turquan.*—Average age of fathers at the birth of children:—

$$= \tfrac{1}{7}\,(20 + 21 + 23 + 27 + 30 + 32 + 34) = 26.7$$

(*b*) *Method of Rümelin.*—Interval between birth of father and birth of middle child :—

$$= \tfrac{1}{3}\,(19+29+39) + \tfrac{1}{2}\left\{\tfrac{1}{5}\,(1+2+4+8+11) + \tfrac{1}{2}\,(3+5)\right\} = 33.6$$

(*c*) *Method of Vacher*—Interval between birth of fathers and births of children :—

$$= \tfrac{1}{3}\,(19+29+39) + \tfrac{1}{7}\,(1+2+4+8+11+3+5) = 33.9.$$

Thus Vacher gives a larger number than Rümelin, and Rümelin a larger number than Turquan.

The data for Paris and also for New South Wales shew that the results obtained according to Turquan's and Vacher's methods are not the same, the difference for Paris amounting to 2.6 years for males, and 3.5 years for females; and in New South Wales to 2.7 years for males, and 2.9 for females. In this instance Gini states that Rümelin's method cannot be employed.

In discussing which of the three methods is preferable, Gini makes observations that may be summarised as follows :—From the demographic point of view the difference between ages of parents and children is of importance, as this is the interval between two generations; and the schematic example given indicates that it might be obtained as follows :—

$$\tfrac{1}{7}\,(1890+1891+1893+1897+1900+1893+1895) - \tfrac{1}{2}\,(1870+1861) = 28.6\,;$$

the first part denoting the years of birth of sons (7) and the latter of the fathers (2). From the economic point of view, *i.e.*, in the case of the valuation of the private wealth of a country, Gini affirms that it is important to recognise that :—

If the property left by a person is derived entirely from his own thrift, then the amount of the properties left at their deaths by the children of two generations will be in proportion to their numbers. In that case the method of Turquan should be used, as it takes the age of parents into account every time they have children.

But of properties left to successors it not infrequently happens (in Europe at least) that only a relatively small portion is due to thrift, the greater portion having been inherited. The amount of property left by the children at their deaths will therefore be less than proportionate to their number. Turquan's method would, therefore, by taking the interval between the births of parents and children, furnish too small a result for the calculation of the private wealth.

It ought also to be observed that in order, at any given moment, to obtain the average devolution-interval (denoted by Gini by i_d) we must determine the mean interval between the births of parents and children, not merely for those persons who actually *register children*, but for those persons who actually *die*. In the meantime the average age of persons marrying, the interval between marriage and first birth and the interval between first and last births, may have altered.

The whole position may, therefore, be summed up as follows :—The various methods (Vacher, Rümelin, Turquan) adopted in the determination of the duration of generations are not at all equivalent, and lead to sensibly different results. For the purpose of the calculation of private wealth none of them is exact, as the result according to Turquan is too small, and according to Vacher and Rümelin too large. It is, therefore, necessary to be satisfied with rough approximations. In another direction, a source of error lies in the fact that in the case of persons dying the interval between births of parents and births of children is taken as equal to that found for persons who at that time register the birth of children.

Those who deduce the interval of devolution from the interval between the birth of parents and the birth of children, regard this latter as coinciding with the interval between the death of parents who have survived grand-parents and the deaths of children who survive parents.

Setting the data out in the form of inequalities, Gini has shewn that :

(*a*) If it be assumed that the interval between the death of parents and the death of surviving children corresponds to the interval between the birth of parents and the birth of their children, an error is made which, according to the nature of the cases, may lie in either direction, but the amount of which is generally not very serious.

(*b*) If the mean duration of life remain constant, the interval between the birth of parents and the birth of their children is greater than the interval between the death of parents and the death of surviving children.

(*c*) If the mean duration of life increase, there may be a difference in the opposite direction. It will certainly be an advantage if the increase in the duration of life can be taken into account. But we have to consider that the influence of that increase is more complex than has hitherto been believed, and that the increase in the mean duration of life is different, and probably very different (?) in the case of heirs from that of the total population (*op. cit.*, pp. 60, 61). This deduction is of doubtful application in Australia.

He adds further that those authors who have calculated private wealth by the method of the interval of devolution have assumed that this interval corresponds to the mean interval between the death of parents leaving property and the death of children inheriting property, an hypothesis, however, which he points out is not in accordance with reality (*tale ipotesi non corrisponde a realtà*). He has shewn by an example which, though only schematic, leads to substantially correct conclusions, that the interval of devolution is notably smaller than the interval between the death of parents leaving property and the death of children inheriting (*ibid.*, pp. 61-63).

Dividing testators into three classes, viz. (i.) married or widowed persons with issue ; (ii.) married or widowed persons without issue ; and (iii.) unmarried persons ; and making certain suppositions which, even when they are not strictly true, do not sensibly prejudice the result, he establishes mathematically that the interval of devolution is appreciably smaller than the mean interval between the deaths of parents and the deaths of their children. These suppositions are :—

(*a*) That the possessors of property of one generation die before those of the following generation ; he discusses also the limitations to this supposition.

(*b*) That the heirs of a married person 'with pre-deceased issue' are the widow, widower, or the (surviving) children; and that the heirs of a widower or widow are the children; that the heirs of an unmarried person are brothers, cousins, nephews, or 'strangers in blood'; that the heir of a husband or wife, pre-deceased without issue, is always the surviving wife or husband; and that the heirs of the latter are brothers, cousins, nephews, or 'strangers in blood'.

Then, taking into account the experience in Italy from 1872 to 1905, as to the frequency among deaths of unmarried as compared with married, and the experience of Budapest and France as to the proportion of marriages dissolved without issue, and assuming also the relation which the value of property left by the predeceased husband or wife to the surviving partner bears to the value of the property that the latter leaves to the children, assumed as 1 to 10, he deduces for the mean interval between deaths of parents and the deaths of their children, i_m, and the proper devolution interval, i_d, a difference of 8 years, the latter being the smaller, *i.e.* :—

i_m = 34 years; but i_d = 26 years only.

This does not purport to be an exact or definite relationship between the two methods of estimating the devolution-interval, but is taken merely as shewing unquestionably that "the devolution-interval is appreciably smaller than the mean interval between the deaths of parents and the deaths of their children. Celibacy, the failure of issue in many marriages, and inheritance between husbands and wives, which result in the succession of persons of a more advanced age, explain the difference between these two intervals."

Gini points out that historical data afford evidence of the truth of this conclusion, and that in every dynasty of sufficient duration it is found that the average length of a reign is less than the average interval between the death of a king and the death of an ascendant who preceded him. He gives four examples, to which we here add two others, viz., the experience in the Houses of Hapsburg and Hohenzollern. It may be remarked that, since among monarchs bachelordom is quite exceptional, the difference is due exclusively to the absence or predecease of sons. In the table below the four first results are those given by Gini :—

Dynasty.	Period Considered.	Number of Reigns.	Mean Duration of Survival of a King to his Predeeessor in Years.		
			All Reigns.	When the Predecessor was	
				An Ascendant.	A Collateral.
England ..	1035-1901	34	25.5	30.4	19.2
France	996-1850	36	23.7	26.6	17.1
Savoy	1060-1900	38	22.1	24.6	16.8
Oldenburg ..	1481-1906	16	26.6	27.9	20.7
Hapsburg ..	1273-1848	26	22.1	23.8	18.2
Hohenzollern ..	1415-1888	19	24.9	5.9	21.5

The differences between the figures in the 5th and 6th columns vary from 4.4 to 11.2 years.

Gini argues that a better approximation of the values of i_m and i_d can be obtained whenever figures are available shewing the degree of relationship of heirs to whom portions of the properties are left, and he gives instances from Italian and French statistics.

In Italy a distinction is made between 8 categories, viz. :—

Group A. (*a*) Ascendants and descendants (exclusive of adopted children); (*b*) uncles and nephews ; (*c*) great uncles and great nephews.

Group B. (*d*) Husbands and wives ; (*e*) brothers and sisters ; (*f*) other relatives up to the sixth degree ; (*g*) relatives beyond the sixth degree, "strangers in blood," and institutions other than benevolent or mutual aid.

There is another category, viz., (*h*) benevolent and mutual aid institutions. On distributing successions of very small amounts (less than 100 francs) between the two groups, Gini obtained for the five financial years 1903-4 to 1907-8, for property left less succession duties, the following result, expressed in francs :—

Group A, 3,434,301,000 = 78.1% ; Group B, 961,855,000 = 21.9%.

For group A, the interval of devolution corresponds to the interval i_m between the death of parents and the death of surviving children, there being compensating features ; and the interval of devolution for group B, denoted by k, by Gini, is much shorter. He found the value for the former to be 34 years, and for the latter 17. Hence the weighted mean is 30.28 years, *i.e.*, 34 is multiplied by 0.781 plus 17 by 0.219.

Gini classified "donations," which here would be known presumably as "settlements," and for the combined figures in francs for the six financial years 1900-1 to 1905-6 he obtained :—

Group A, 4,675,910,000 = 80.4% ; Group B, 1,139,099,000 = 19.6%.

With the values 34 and 17 as in the preceding case, these weights give 30.67 years. Gini concluded that these two values, viz., 30.28 and 30.67, are probably somewhat under the mark, and he supposed therefore that the true devolution interval is about 31 years, betraying incidentally the imprecision of the result.

In France there are no less than 14 categories, which can be grouped in a similar manner, with the result that in groups A and B, the values in francs of the net property, viz., property left, less succession duties, are as follow :—

Group A, 3,526,179,000 = 77.5% ; Group B, 1,024,059,000 = 22.5%.

Weighting the values 34 and 17 accordingly, he obtained 30.17 years as the true devolution interval, which does not differ very greatly from the preceding result. His conclusion was that the hypothesis that the interval of devolution corresponds to the interval between the death of parents and the death of children surviving them, does not hold good in reality; in fact, that the interval of devolution is shorter by about three or four years (*op. cit.*, p. 67).

Gini recognises that for males and females, the interval of devolution is conspicuously different, the former generally leaving much larger properties than the latter, while the mean duration of life of females is greater than that of males. He then shews algebraically that, if the mean interval between the deaths of parents and children is calculated without taking these facts into account, the figure is too low for computing private wealth ; *vide* his work, pp. 67-68. He remarks that in Italy the proportion of properties left by males compared with that left by females is about 2 to 1, but in German and Anglo-Saxon countries is much higher, being in Victoria (1908) about 5 to 1 ; in Massachusetts (1898-91) about 3 to 1, and even as high as 14 to 1 in 1829-31.

It has also been recognised by him that it is necessary to take account of the consequence of the age of marriage in persons of various social classes ; richer males, for example, marrying later than poor males ; and for this figures are given for Denmark by Rubin and Westergaard, for England by the Registrar-General (49th Report), for the nobility of Sweden and Finland by Fahlbeck, for Italy in the *Movimento della popolazione secondo gli atti dello stato civile*, 1896 and later, for Austria in the population returns of 1895, and the following years. In regard to brides, there appears to be no regularity, the age being almost the same for all social classes in Denmark ; in England brides of the better classes are older ; while in Sweden and Finland brides of the nobility are younger than those of the population as a whole. The general conclusion may be drawn, however, that the mean age of persons of both sexes marrying is generally higher for the richer section of the population in the countries referred to. Consequently, if each case be weighted proportionately to the value of the property, a higher figure would be obtained than that arrived at by a simple arithmetic mean. In pointing this out Gini adds that, though the circumstances indicated have the effect of thus making the exact figure for the interval of devolution greater, other circumstances have a contrary effect. He remarks that rich persons have less children, and ordinarily these follow one another at longer intervals. He infers that on the whole it is probable that the interval between marriage and the birth of the middle child is greater for the poor than for the rich; *vide* p. 70. The influence of fecundity on the interval he points out can be concluded from available data ; thus, in Paris, where the fecundity is low, it is 5 years ; in New South Wales, Australia, 7.6 years. Further, celibacy is more frequent among the rich than among the poor, as also is childlessness of parents ; hence collateral successions are more frequent, the effect being, as he has shewn, that the interval of devolution is sensibly shorter than for direct successions.

Henry and Lavergne (see bibliography) point out another circumstance which has the effect of making the weighted mean of the intervals of devolution smaller than the simple mean. They observe that it may be admitted that, in the average number of cases (*i.e.*, in Continental Europe), the property of the married person dying first is equal to the property of the surviving partner. But a portion of the property of the partner dying first goes to the surviving partner. On that account the second inheritance which the children make from their parents, and which they will enjoy for a shorter time, will be greater than the first inheritance. Using B to denote the proportion of the property left by the partner first dying to the surviving partner, Gini derives the first of the two formulae shewn below as a first approximation. But since in Italy in recent years the proportion of married males to married females dying was found to be as 4 to 3, owing to the fact that husbands predecease their wives more frequently than survive them, it was necessary to take this into account, and also the fact that (at least in Italy) the property of the husband in relation to that of the wife is about 2 to 1. Having regard to these circumstances Gini deduced the second formula ; and taking the values for $i_m = 34$, $\kappa = 17$, and $\beta = \frac{1}{11}$, obtained from the first formula 32.52, and from the second 32.84; *vide op. cit.*, p. 71.

The formulae referred to are :—

(2). . i_d , corrected, $= 2\, i_m / (2+\beta)$, to a 1st, and $= \left(\frac{21}{11}\, i_m + \frac{\kappa}{22}\right) \Big/ \left(\frac{21}{11} + \beta\right)$

to a 2nd approximation. This is of course valid only for Italy and countries similarly circumstanced.

Other circumstances which exercise a different influence in different nations are (*a*) the average age of persons marrying; (*b*) fecundity; (*c*) prevalence of celibacy; (*d*) the infertility of marriages; (*e*) the relative frequency of succession by husbands and wives, and by collateral relations. Gini remarks that in Italy these circumstances caused variations even from province to province. He adds that "on the other hand no influence is exercised on the calculation of the interval of devolution by the fact that the testators leave larger amounts of property when they are more advanced in age," and he mentions that Mallet and Beneduce regard this fact as important. It may be remarked, *en passant*, that this can hardly be correct, and will be referred to later. According to Gini it is not a question of the mean age of testators, but only of the interval between their death and that of their heirs. These are reasons for the statement that the interval between the death of a testator and that of his heir is different when the testator is older and therefore, on the average, richer, than when he is younger, and consequently on the average poorer. But the interval is greater in the second case and not in the first.

If a testator has more than average time to augment his hereditary property, this augmentation may be due to two causes, either (*a*) because he dies at a greater age than the average, and then it has to be assumed that his heir will have less than the average time to augment the inheritance left to him; or (*b*) because the person from whom the testator himself inherited died younger than at the average age, in which case the capital he inherited must have been less than the average. It therefore seems clear, he adds, that—if the interval of devolution be not on the average different for categories of the population more or less rich—the fact that testators dying at an advanced age leave more property in individual cases can have no influence. As previously indicated, the validity of this view is questionable, and to this point we shall return.

Gini's summing up in regard to methods of evaluating the devolution-interval is as follows:—

(i.) The various methods used for calculating the interval between the birth of parents and the births of children give different results, which are always approximate, but may be either in excess or in defect.

(ii.) The taking of the mean interval between the birth of parents and the births of children as equivalent to the interval of devolution is based on suppositions which are not supported by facts.

(iii.) It is necessary, first of all, to make use, not of a simple arithmetic mean, but of a weighted arithmetic mean, which takes cognisance of the fact that the interval of devolution is different for categories of persons with more or with less property.

(iv.) Regard must be had to the fact that the interval between the birth of parents and the births of children does not, on account of many circumstances, correspond to the interval between the death of parents and the death of their surviving children.

(v.) It would certainly be desirable, but is not generally possible, to take all these circumstances into account. But it is possible and necessary to have regard to one most important circumstance, viz., that the interval between the death of parents and the death of their children is appreciably longer than the interval between the death of testators and the death of their heirs. This circumstance is due to the fact that the interval in the case of successions by strangers in blood, by collateral relatives, and by husbands or wives, is shorter than in the case of direct succession.

(vi.) It should therefore be remembered that if this circumstance is not taken into account, the calculated interval of devolution is about 3 or 4 years too high. The figures for the interval of devolution, now put at about 33 to 34 years, should, therefore, be lowered to, say, 29 to 31 years (*op. cit.*, pp. 72-73).

Illustrating by a detailed example for Italy in 1905, Gini calculates the mean ago of bridegrooms at 29.10, and of brides at 25.13 years, and gives the following results for the years 1902-1906, which shew a small but definite change :—

—	1902.	1903.	1904.	1905.	1906.
Bridegrooms	29.29	29.27	29.25	29.10	29.07 years
Brides	25.22	25.21	25.18	25.13	25.07 ,,
Differences	4.07	4.06	4.07	3.97	4.00 ,,

By weighting the corresponding figures for Italian provinces (1905) by the ratio of the inheritances in every province to the inheritances in the whole kingdom, he obtains the result for bridegrooms =29.07, and for brides =24.91 years. All these figures are approximately 29 and 25 years.

In Italy the mean interval between the date of marriage and the mean date of birth of all children can be taken as about 8 years. The mean age of fathers at the mean date of the births of their children in Italy is probably not far from 34 years, and of mothers from 30 years. These figures agree fairly with those found by Raseri for Udine, viz., fathers=34, and mothers = 30.5, and for Rome, viz., fathers=36.5, and mothers = 29.6. Basing his conclusion on these various sets of figures, Gini takes the mean interval between the birth of fathers and children as 35 years, and between the birth of mothers and children as 31 years. Owing to the increase in the duration of adult life, however (presumably for 1882 to 1901 ; *vide op. cit.*, p. 76) he calculates from this the interval between the death of parents and children for fathers =36.17 years, and for mothers =32.17 years. These intervals, he thinks, correspond to the devolution-interval in 78-80% of all cases of inheritance, while in the balance of cases it is not more than 17 years. Taking 80%, this gives the devolution-interval from fathers to sons =32.34 years, and from mothers to daughters = 29.14 years. For adult ages, the difference in the duration of life for males and females is about 6 months. Assuming, it would seem somewhat at hazard, that property inherited by males is to property inherited by females as 3 to 2, and that property left by males is to property left by females as 2 to 1, he deduces the devolution-interval i_d for Italy as 31.8 years ; and by a similar calculation, that for France as 29.4 years. Mallet, he points out, and as mentioned before herein, endeavoured to determine the devolution-interval by means of the figures shewing the expectation of life of heirs from 272 cases in which all particulars were known ; and used the English Life Tables, 1891-1900[1]. He found the simple means (that is, weighted merely according to numbers) of the expectation of life $i'_m = 24$, and the weighted mean (that is, weighted by the aggregate amount or product of the numbers and amount per individual) $i''_m = 26.9$ years.

Arguing from the peculiarities in English inheritances (more frequent transmission of real than of personal property to lineal descendants, no transmissions of real property to widows, etc.), Mallet thought the devolution-interval should be taken as about 24 years (*loc. cit.*), but Gini justly points out, and it is recognised by Mallet,

1. See Jour. Roy. Stat. Soc., lxxi., pp. 80-83, 1908.

that 272 cases are too limited a basis ; further, that the mean expectation of life may possibly be greater for those possessing property than for others ; and again, that amongst those possessing property it possibly increases with the amount of property. If this were so, Life Tables would be required giving the expectation of life at single ages for possessors of property only, and the figures would have to be weighted according to the amount of property : this cannot at present be done.

Harper proposed to use the British Insurance Offices' Life Table O^M, and by that means found i''_m = 27.4 years. This appears to Gini to be too low, partly because the greater expectation of life of females is disregarded, and partly because the mean expectation of life of heirs was not weighted in proportion to the property inherited.

Gini himself proposes the use of the difference between the mean age of testators and the mean age of heirs, and to weight the ages proportionately to the property involved, and he arrives at the following conclusions :—

" The devolution-interval is given by the difference between the weighted mean age at which persons inherit, and the weighted mean age at which they transmit the inherited property ; where the ages of the various persons are weighted proportionately to the amount of the inheritance." As, however, it is not possible to follow up individual persons from the moment when they inherit to the moment when they, in their turn, transmit their inheritance, this has to be modified as follows :—

" The devolution-interval can be determined, as a first approximation, by means of the difference between the weighted average age of heirs and the weighted average age of testators of the same year."

This, denoted by i'_d, will be the exact devolution-interval only if the mean duration of life of proprietors remain constant. Since, however, this continues to increase, a second approximation should be made, when the weighted ages of both testators and heirs have been determined for a long series of years, together with the respective values of i'_d. Then we are able to state that " the devolution-interval can be determined from the difference between the weighted average age of the testators of a given year and the weighted average age of heirs at id years before."

Mallet's calculations, he asserts, furnish the data for this. They give the simple and weighted averages of ages of heirs = 45.2 and 41.0 years respectively. From the same figures Gini computes the ages of testators for the two years 1905 and 1906, and found the simple and weighted averages of ages of testators = 64.4 and 69.7 years respectively. This gives the mean devolution-interval = 69.7 — 41 = 28.7 years.

Gini maintains, however, that this is too small, because the mean duration of life of proprietors increases with the time. On the other hand it must not be forgotten that the average age of heirs was calculated on a very small number, and that the average age of testators refers to possessors of at least £100.

For Victoria, Australia, in 1908, the simple and weighted averages of the ages of testators was found by Gini to be respectively :—

Males.	Females.	Persons.
64 1 and 72.2 years.	64.1 and 68.2 years.	64.1 and 71.5 years.

For France, in 1906, the simple average age of testators was 61 years 7 months. The use made of this figure in subsequent calculations (by which March found the devolution-interval = 29 years 5 months) is pointed out by Gini to have been based upon several erroneous assumptions, viz., that the heirs were supposed to be distributed in ages as the people living, and that the simple mean was satisfactory. March, having found the mean age of the living at the 1901 Census to be 31 years 2 months, deducted it from the simple mean of the ages of the testators 61 years 7 months, the difference 29 years 5 months being assumed to represent the mean devolution-interval. The computation Gini points out is, however, unsatisfactory, because on the one hand the heirs are distributed in respect of age quite differently to the living, and on the other hand because the calculation of the average age from the simple instead of the weighted mean leads to sensible error. It is, however, to March that credit is due for having first thought of deriving the devolution-interval from the difference between the mean age of testators and the mean age of heirs.

In closing this aperçu of Professor Gini's criticism of the devolution-interval method, it may be remarked that he recognises the grave limitations to which it is subject, and on this matter we shall offer later some further observations. It is quite clear that the devolution-interval is different as between country and country, and the data necessary for its proper computation are at least as elaborate as the data necessary for computing by another and more direct method. Before proceeding with a discussion of this, it will not be inappropriate to give Gini's general conclusions in respect of various methods of computing private wealth. These are as follow :—

(*a*) All methods have both advantages and disadvantages.

(*b*) It is impossible to assert that one is theoretically superior to another ; but it must, on the contrary, be held that according to the statistical data available for a country, so is one or the other method the better.

(*c*) Though the method of the devolution-interval seemed, for a long time, to be the safest, new elements of uncertainty are continually being discovered in it ; its application in Italy was, however, justified in the past, inasmuch as the necessary data for the other methods were lacking.

(*d*) The method of the capitalisation of incomes may perhaps give fair results for the United Kingdom, but cannot be based on any secure foundation in other countries.

(*e*) In Sweden, Hungary and France the Inventory-method may perhaps lead to the best results.

(*f*) A plausible application of any other method to all forms of wealth can hardly be conceived. But that does not imply that in the valuation of the different categories of wealth it is necessary always to use the same method. [The author appears to ignore the essential conceptual difference between the rate-of-devolution method and the interval-of-devolution method.]

(*g*) Further, if in the case of any country, one method appears preferable to the others, the latter may still offer useful elements for the purposes of independent estimate or checking.

(*h*) There are methods, such as that of the proportion between existing and hereditary property, which, although they may not lead to a satisfactory evaluation of the wealth of any given country, may serve in a comparison of the wealth of different countries, so far as the uncertainty and the inexactitude of the evaluations in various countries depend upon uniform circumstances.

(*i.*) Finally, it appears that hitherto the statisticians have been often too exclusive in the choice of their methods, and consequently the maxim to be observed by anyone who undertakes the calculation of wealth is :— "The best method consists in taking advantage of all methods" (*op. cit.*, pp. 140-141).

3. **The defect of the devolution-interval method.**—The preceding discussion by Gini of the devolution-interval method exposes the complexity of its assumptions, and reveals something of its inherent uncertainty. The fact that it depends upon so many changing factors, the precise estimation of which is not unattended with difficulty, and the appropriate corrections for which moreover are uncertain, and the further fact that its pitfalls are not obvious, indicate that it should be abandoned if any method, the intrinsic character of which is more obvious, can be employed. It will be seen later that there are elements also which it does not embrace.

Professor Gini's very able discussion of the proper computation of the devolution-interval shews conclusively that factors must be applied which take account, not only of the magnitude of successions and of settlements, but also of sex differences in regard thereto, and of the variation of these with time.

Let us fix our attention upon the question of the devolution-interval in regard to the persons (with the requisite wealth) living at say the present moment. An infinitesimal group at age x will live on the average say e_x years, e_x being the expectation of life for the age x; in other words, this period will be the *crude* devolution-interval for all persons of age x. We will, however, be in error if we assume that the $(1/e_x)$th part will pass in one year. In order to find the true amount it will be necessary to take into account the manner in which e_x is ascertained, because the number of persons of any age x does not decrease with the lapse of time in a linear manner. When account is taken of the non-linear character of the decrease it is immediately evident that *we are concerned, not with the expectation of life or devolution-interval, but with the devolution-rate or instantaneous rate of mortality*; and the average of this taken over one year will be the rate of mortality for the middle of the year. It is, of course, true that there are analytical relations between the "expectation of life" at various ages and the rate of mortality at various ages, but if we posses the latter we need not concern ourselves in regard to the former in order to ascertain with what rapidity the wealth of the community will pass to successors. In fact, the necessity of ascertaining the devolution-interval was for no other purpose than this. From this point of view it is at once seen that *the attempt to introduce the general devolution-interval into the question is a useless complication*, not merely because it needs so many correcting modifications, but also because *the fundamental idea that this interval is required, or is the appropriate quantity to use, is really invalid.* In short, the crude basis of the idea, viz., that if the existing wealth in any generation passes in the interval i to another generation, the ith part passes in one year is not correct. The rapidity of passing is measured by the death-rate itself, and in order to measure the *rate of devolution* of estates it merely requires that the frequency of deaths in various age-groups—and, since the amount per individual passing at death varies with age, the relative importance of each age-group in respect of wealth—should be known.

Thus the idea of the "devolution-interval" should be abandoned and in its place the idea of the "rate of devolution," should be adopted, computing this latter by means of the death-rates at different ages, *weighted according to the average amount of wealth possessed at these ages.* For this purpose only statistics of the rate of mortality for different ages and of the ages of persons dying and of the size of

their estates is needed. It will be seen that the mere statement of this method indicates at once its superiority over the method of ascertaining the devolution-interval. In principle it is *direct* and, so far as it goes, *exact*. Unfortunately, however, the conception put forward, though lacking nothing in accuracy as regards principle, is inadequate in regard to the proper definition of all the relevant circumstances. This will appear as we proceed, and we shall endeavour to exhibit its limitations as well as to illustrate its technique. We shall call the method which we now proceed to examine the "Devolution-Rate Method" in contra-distinction to the "Devolution-Interval Method." To what has been said, it may be added that the rate-of-devolution method might quite appropriately be called the rigorous "parcel method," because the fundamental conception is that the incidence of death is indiscriminate, and therefore those dying in each age-group are, with some limitations, a representative sample of the entire group.

CHAPTER II.—THE RATE OF DEVOLUTION.

1. **The devolution-rate method.**—In his contribution to the discussion of Messrs. Harris and Lake's paper on "Estimates of the Realisable Wealth of the United Kingdom based mostly on the Estate Duty Returns,"[1] Sir T. A. (then Mr.) Coghlan made an important suggestion that the "only true way of ascertaining the wealth of those alive from the amount of those who had died during a given period, was to take into consideration the ages of persons both living and dying" (p. 736). He advised the formation of age-groups, the finding of "the average wealth possessed by the persons in each category" (*i.e.*, age-group), and then by "multiplying the amount so ascertained by the numbers then living belonging to each category" (group), "they would arrive at the total wealth of the community" (*ibid*). This suggestion was applied by Mr. Bernard Mallet in his paper of 18th February, 1908 (Journ. Roy. Stat. Soc., lxxi., pp. 65-84, 1908), and he deduced values for England for 1905 and 1906 by this method (*loc. cit.*, p. 74). The statement of the method as it appears above needs some qualification, which will be discussed in due course.

The principle of the devolution-rate method more rigorously stated is as follows :

(i.) Assuming that at each age those dying fairly represent, in respect of wealth possessed, the living at the same age, the ratio at that age of the living to the dying is the factor to be multiplied into the aggregate wealth possessed by the dying in order to express the wealth of the living.

(ii.) Since experience has shewn that the mortality-rate at any age differs as between males and females, and that the average wealth possessed also differs, the wealth possessed by the sexes should be estimated separately in order to secure precision in the results.

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1. Journ. Roy. Stat. Soc. lxix., pp. 709-732.

(iii.) If the incidence of death varies as between different classes of either sex at any age, a like observation to (ii.) applies, *mutatis mutandis*.

(iv.) The effect of all circumstances tending to produce a systematic difference in the average wealth possessed at any age as between the living and dying at that age must be evalued and allowed for, in order to secure correct results.

In regard to the last, it will be seen hereinafter that there *are* such differences, and therefore Coghlan's principle and Mallet's application of it need some amendment. The devolution-rate method has virtually been used by Laughton[1] and by Gini in the work previously mentioned.

2. **Discussion and technique of the devolution-rate method.**—Sufficient has already been said to indicate clearly in what sense the method can be conceived as being founded upon the devolution-rate. In formulating the statement of its technique the notion of the method as a " parcel-method" will be kept mainly in view, though we shall use either conception indifferently, since they both are appropriate, and both points of view have value. In some cases it may be easier to grasp the significance of the facts from the one or from the other point of view. The whole matter, however, will appear more definite if it be borne in mind that, subject to certain limitations, the dying are to be taken as a sample of the living in regard to the wealth coming into evidence in the " successions." The limitations referred to, however, are important, for it will be found that there are reasons for believing that the living must be regarded as in some respects differently characterised in regard to wealth from the dying ; and it is also to be borne in mind that the rigour of the " parcel" assumption increases as the age-group diminishes, since the death-rate varies conspicuously from age to age. We proceed to consider the technique of the method.

Probate returns reveal the fact that D persons dying in any age-group were, in the aggregate, possessed of the amount of wealth w, say. If they be regarded as a fair sample of the group, then the aggregate of wealth, W, in the same age-group, will be the ratio of the living to the dying ($L/D = R$ say) multiplied into the wealth possessed by the D persons, *i.e.* :—

$$(3)..... \quad W = wL/D = wR = w/r.$$

in which r, the reciprocal of R, is the death-rate.

It has been suggested, however, that the general rate of mortality of the age-group does not accurately represent the class whose wealth comes under review in probate returns, forasmuch as it has been supposed that the death-rate for that class will be less, for example, than that for all classes combined. Thus Mr. A. M. Laughton, the Government Statist of the State of Victoria, expresses the opinion that " it is probable that the rate of mortality among persons having property is below that prevailing in the general community ; and that it will approximate to the rate among assured lives."[2] It may be added that probably each country has its special characteristics as regards this. If the view expressed be just, then the multiplier R will not be strictly correct. This is a point which must hereinafter necessarily be fully considered.

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1. Vic. Year Book, 1911-12 pp. 215-217. 2. Victorian Year Book, 1911-12, p. 216.

3. **The error of treating the entire population as a single age-group.**—The most elementary application of the preceding formula would be to treat the entire population as forming a single age-group, that is, to assume that the living and dying are similarly constituted as regards wealth. In this case the aggregate of wealth, W, of the community, *or at least that part of it which would pay probate*, is :—

$$(4).....W = Pw/D = w/r = Rw;$$

the heavy letters having the same meaning as indicated above, viz., in § 2, but applying to the entire probate-paying group.

We shall see later that this assumption leads to a result very much in excess of the truth, if applied to the entire population. For in the State of Victoria for the years 1908 to 1912 inclusive, we obtain the following results, I. to IV., according as they are calculated for males and females together or separately.

In the Table hereunder (I.) shews the result obtained by computing with the total population as a single age-group ; (II.) shews that obtained by computing with all males as a single age-group ; (III.) is based on a computation with all females as a single age-group ; and (IV.) gives the result obtained by combining computations (II.) and (III.).

Table shewing Corrections required for various methods of Estimating Wealth from Probates, Victoria, 1908-1912.

Item. Year	1908.	1909.	1910.	1911.	1912.
(I.) Net Value Estates, "Persons" (Unit £1000)	6,717	6,178	7,031	7,976	7,776
Reciprocal of Death-rate	78.68	87.36	87.05	86.78	81.77
Product (Unit £1,000,000) (1) ..	528.5	539.8	612.0	692.2	635.8
Factor to correct†	.3275	.4138	.3542	.4216	.3954
Error of Method (reciprocal of factor)	3.053	2.417	2.823	2.372	2.529
Correctly deduced amount (Unit £1,000,000)	173.1	223.3	216.8	291.8	251.4
(II.) Net Value Estates, "Males" (Unit £1000)	5,580	4,883	5,481	6,382	5,962
Reciprocal of Death-rate	69.04	76.92	78.08	78.75	74.65
Product (Unit £1,000,000) (2) ..	385.2	375.6	428.0	502.6	445.1
Factor to correct†	.3341	.4219	.3580	.4343	.4099
Error of Method (reciprocal of factor) ..	2.993	2.370	2.793	2.303	2.440
Correctly deduced amount (Unit £1,000,000)	128.7	158.5	153.2	218.3	182.4
(III.) Net Value Estates, "Females" (Unit £1000)	1,137	1,295	1,550	1,594	1,814
Reciprocal of Death-rate	90.92	100.6	98.12	96.55	90.36
Product (Unit £1,000,000) (3) ..	103.4	130.3	152.1	153.9	163.9
Factor to correct†	.4292	.4969	.4174	.4775	.4204
Error of Method (reciprocal of factor) ..	2.330	2.012	2.396	2.094	2.379
Correctly deduced amount (Unit £1,000,000)	44.4	64.7	63.5	73.5	68.9
(IV.) Sum of (2) and (3) (Unit £1,000,000) ..	488.6	505.9	580.1	656.5	609.0
Factor to correct*†	.3543	.4414	.3737	.4445	.4126
Error of Method (reciprocal of factor) ..	2.822	2.266	2.676	2.250	2.424
Correctly deduced amount (Unit £1,000,000)	173.1	223.3	216.8	291.8	251.4

* Is not required practically. † To give the results of infinitesimal grouping.

It will be seen from these results that, when males and females are treated separately, the sum of the two is uniformly less (on the average about 5½ per cent.) than when the population is treated without distinction of sex. This is due to the great disparity between the amounts contributed by females and males. From what is shewn later it will be seen further that *correction factors* are necessary; these are shewn in the table and indicate *the magnitude of the error in the assumption that the results for all ages can be treated as a single group as has often been done*; it will also be observed that these correcting factors are different from year to year. The correction-factor for "persons," for the average of the 1908-1912 results, is 0.3822.

Here it may be observed that any population consists roughly of equal numbers of the sexes, but the data shew that not only have females on the average much less wealth than males, but also there are fewer possessing wealth; hence result (1), see table, based on the number of persons, will in general be of less accuracy than that based upon a consideration of the data for the sexes treated separately. An analogous observation applies to the age-groups among either sex. It is due to this latter that the large correction factor is required, and to this we shall now refer.

The correction-factor for the average of the 1908-1912 results for "males" is no less than 0.3908; and the correction-factor for "females," on the same basis, no less than 0.4471. (The way in which these correction-factors are deduced is explained hereinafter.) It is fairly evident from these examples that the method, even with the use of the deduced correction-factors, cannot be expected to yield results of high accuracy, since the correction-factors vary greatly from year to year.

Assuming that the persons of each age dying are characterised, in respect of wealth possessed, similarly to those living of the same age, then it follows that for the dying to correctly represent the living, it is essential *either* that the numbers dying in each age-group must be proportional to the numbers living in the same groups; that is to say, the death-rate must be the same for all ages, *or* that by some complex relation the wealth-ratio will be fortuitously identical. The latter supposition is obviously excluded as a general possibility; and above 5 years of age the death-rate is small where the numbers of the population are relatively large, and large (for the older ages) where the numbers of the population are relatively small. Hence, *a priori*, it is obvious that the whole range of life cannot be treated as a single age-group. To do so cannot yield an accurate result, or one even approximately correct. We have already seen that it does not do so, for the correcting factor, instead of being nearly unity, was only about 0.4.

4. **The error of estimations of wealth by attributing it to a single age-group of 21 years and upward.**—The characteristic defect in the assumption that the population may be treated as a single age-group will apply to any large age-group, but will be less serious if we exclude the ages, viz., the earlier ages of life, which, while they contribute little or nothing to the probate-returns, exhibit considerable fluctuations in their death-rates.

It has sometimes been assumed, in estimating wealth from probate-returns, that it would be sufficiently accurate to regard adult lives as constituting a homogeneous group, and consequently that it would be satisfactory to suppose that the whole of the wealth disclosed in such returns could be divided by the total number of adults dying in order to obtain the average per individual. This, it was thought, could be regarded as the average wealth per head of *all* adults; hence, by multiply-

ing this average by the total number of adults living, the aggregate private wealth would be ascertained, subject of course to some correction for the fact that there is no necessity to make probate returns for less than a certain amount. This *very erroneous method* has even been used in official statistics.

The method approximates, however, somewhat more closely to the truth than the previous assumption under which the entire population was treated as a single age-group, and was used in Victoria for estimating the average net value of estates for 1898-1902. The amount per head of deceased adults was computed, and this amount, multiplied by the number of adults at the middle of the period (or rather those disclosed at the Census of 1901) was regarded as indicating the total private wealth. It will be seen later that the error of this assumption is considerable, and that the method should not be followed. As already indicated, it virtually treats the entire population (of both sexes) of 21 years of age and upward as a homogeneous age-group, and attributes the net wealth disclosed in the probate returns to the adults dying. It therefore supposes that they may be taken to fairly represent the adults living, and that no serious error will be made in supposing that the whole wealth of the community belongs to the adults.

In this method the value of **R** in formula (4) will be the reciprocal of the death-rate for all ages from the beginning of 21 upwards, and the magnitude of its errors is fully illustrated in the tables hereunder, that is to say, the result so deduced must be multiplied by the correcting factor indicated in the table to give the proper result. This factor would be, of course, unity if the method were correct, consequently its reciprocal shews the magnitude of the error arising from neglecting it.

Table of Corrections for Results (wrongly) based upon assumption that Wealth disclosed belongs wholly to those of 21 Years of Age and upwards.

	Year.	1908.	1909.	1910.	1911.	1912.	1908-1912
Males	Reciprocal of Death-rate 21 to end of life	53.43	58.76	60.20	59.86	58.74	58.156
	Correcting factor to be applied to result ..	0.4317	0.5524	0.4643	0.5714	0.5209	0.5066
Females	Reciprocal of Death-rate 21 to end of life	72.30	78.19	77.24	74.33	72.82	74.884
	Correcting factor to be applied to result ..	0.5398	0.6393	0.5303	0.6202	0.5216	0.5678
Persons	Reciprocal of Death-rate 21 to end of life	61.68	67.32	67.82	66.41	65.11	65.619
	Correcting factor to be applied to result ..	0.4551	0.5753	0.4821	0.5831	0.5212	0.5221

It is seen from this that the factor of correction has increased, but it is still only about 0.5 ; that is to say, *this method gives results which are about double their true value.*

5. **Determination of factors for correcting large group-results.**—It has already been indicated that if the population be taken either as a whole, or as adults of 21 years of age and upwards, we obtain, as the average result of Victorian probate returns for 1908-1912, an indication that the following corrections are required :—

Factors of Correction, based on Victorian Probate Returns, 1908-1912.

Group considered.	Correcting Factor when Computation embraces :			Error of Neglect of Correction Factor.		
	"Persons."	Males.	Females	"Persons."	Males.	Females
All ages	0.3822	0.3908	0.4471	2.616	2.559	2.237
Adults (21 and over) ..	0.5221	0.5066	0.5678	1.915	1.974	1.761
10-year groups ..	0.9855	0.9873	0.9817	1.0147	1.0129	1.0186
1-year groups	0.9997	0.9997	0.9997	1.0003	1.0003	1.0003

As the method followed increases in precision, the correction-factor approaches unity, hence it is evident that there is no material advantage in considering "adults" as a homogeneous age-group, as compared with the assumption that the entire population can be so regarded ; and this is so even if the sexes be separately considered.

It has not yet been indicated in what way the corrections have been deduced. It will suffice, however, to note that the validity of the assumption of homogeneity increases as the age-group taken diminishes (supposing, of course, the numbers to be sufficiently great) ; and since the sexes are very differently characterised as regards wealth, it is necessary to treat them separately. Hence formula (3), viz., $W = Rw$, should be applied to *small* age-groups only, and their sums taken. (The sexes should also, of course, be treated separately). It is established later that 10-year groups require a correction factor of sensibly unity (0.98 to 0.99), and single year groups practically no correction at all (0.9997).

The details will appear later. It will suffice here to observe that a theoretically ideal method supposes that the continuous variation of both R and w is determined according to age, and that the methods of the infinitesimal calculus are employed, see formula (21) hereinafter.

6. **Determination of the multipliers, independent of, and dependent upon the death-rate, for deducing the total wealth from the wealth disclosed in probate.**—For rough computations, and on the assumption that the relative amount of wealth according to age and the death-rate according to age remain constant, a factor may be readily determined which, multiplied into the total wealth disclosed, will give the aggregate for the same class in the population (living) of the same age. Further, if it be supposed that any increase or diminution of death-rate affects the death-rate at all ages similarly, a factor may be computed which will take account of the changing death-rate and permit of the introduction in the formula of the reciprocals of the death-rate for any particular year. These factors are denoted respectively by the letters k and α, the *approximate* values being *accented*, and the *exact* values, computed on infinitesimal methods, being *unaccented*. We proceed to the detailed consideration of the matter. The fundamental assumption is that, in each age-group, the ratio of those persons dying whose estates come under review for probate, to the total number in the group actually dying, is the ratio d/D (or deceased persons possessing estates to total dying), and that this holds for the living. It must also be assumed that the average value of the estates for such age-group is the same for the living as for the dying. On these assumptions we may deduce the required factors, viz., those which, multiplied into the total wealth disclosed by probate, will give the aggregate of estates similarly liable to come under review for probate.

Let this factor be denoted by k'; then obviously, by mere definition :—

$$(5)\ldots\ldots k'\,(w_1 + w_2 + \text{etc.}) = \mathrm{W}_1 + \mathrm{W}_2 + \text{etc.} = \mathbf{W}, \text{ say,}$$

the total wealth, the suffixes denoting here the successive age-groups. But since it is assumed that the distribution of wealth among the living is the same as among the dying, it follows that, for each age-group, $\mathrm{W} = Pw/D = Rw$; that is, the reciprocal of the death-rate for the age-group multiplied by the wealth revealed in the probates for the group. Hence, substituting this for W, and dividing both sides of the equation by $w_1 + w_2 + \text{etc.} = \Sigma w$, we obtain

$$(6)\ldots\ldots k' = \Sigma\,(R\,.\,w/\Sigma w);$$

each suffix for R being the same as that for the corresponding w throughout. That is to say k' is the weighted value of the R's, the weights being the relative distribution according to age of the wealth disclosed by probate.

From the last formula it is at once evident that the factor k' depends merely upon the product of the *relative* distribution of wealth according to age into the reciprocal of the death-rate according to age; that is, it is affected by changes both in the distribution of wealth according to age, and in the mortality according to age.

The result is important, for it exposes definitely the *invalidity of the attempts to deduce this factor merely from the duration of a generation,* from the general death-rate, or the expectation of life at age 0, or by any similar process; in short, it shews that what is known as the devolution-interval method, which we have already considered at length, is an invalid method.

There is, of course, as already implied, no *necessary* relation between the factor k' and the general death-rate for either sex (or for "persons") of the ages during which it is found through probate that wealth appears in evidence (or if we please, the death-rate for all ages), a point to which reference will be made later. Let, however, a' be a factor which, multiplied into R_0, the reciprocal of this death-rate,* will give k'; that is: let—

$$(7)\ldots\ldots a'R_0 = k';\ \text{so that}\ a'R_0\,(w_1 + w_2 + \text{etc.}) = \mathbf{W}$$

then of course—

$$(8)\ldots\ldots a' = k'/R_0 = \Sigma\,(Rw)\ /\ (R_0\,.\,\Sigma w)$$

By applying this formula it can be discovered whether a' is fairly constant. More accurate results will, of course, be obtained if the factor be deduced for the sexes separately, the method becoming quite rigorous when the age-groups are infinitesimal.

From what has preceded it is clear that it is impossible to deduce the factor which must be multiplied into the wealth appearing in probate returns, unless at least two things are known, viz.,

(*a*) the relative amount of wealth contributed by people in the different age-groups; and

(*b*) the death-rates for the different age-groups, or, as will be shewn, their relative value.

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* That is, for all ages or for the range of ages appearing to be of consequence in probate matters.

In all probability the second of these (b) does not in general change very rapidly with lapse of time; the former (a) changes somewhat irregularly *because of the irregular way in which large estates come under review.* To find the values of $Rw/\Sigma w$ it is, of course, necessary to have the absolute death-rates; but if we assume that the death-rates in each age-group vary as the general death-rate, then their mutual relation is sufficient, taken in conjunction with that general death-rate. It will be most convenient to work with reciprocals $1/r_1$ etc., of the death-rates, say R_1, R_2, etc., or to find the relation of these to the reciprocal of the death-rate for the aggregate of all groups concerned, R_0, say. That is, if the values of $\rho_1 = R_1/R_0$, $\rho_2 = R_2/R_0$, etc., be found, it might be expected that they probably will not change greatly for moderate intervals of time, and, given these for any epoch, the group-rates can be approximately determined therefrom by multiplying by the general death-rate or death-rate of the aggregate. Hence from (6), (7) and (8) we have :—

$$(9)\ldots\ldots k' = R_0 \Sigma(\rho w) / \Sigma w, \qquad \text{and}$$

$$(10)\ldots\ldots \alpha' = \Sigma(\rho w) / \Sigma w;$$

or, if u be written for $w/\Sigma w$, then this last expression takes the form

$$(11)\ldots\ldots \alpha' = \rho_1 u_1 + \rho_2 u_2 + \text{etc} = \Sigma(\rho u)$$

which is *independent of the absolute values both of the death-rate and the wealth at each age.* Then it would follow that

$$(12)\ldots\ldots \mathbf{W} = \alpha' R_0 \Sigma w = k' \Sigma w$$

that is to say, the aggregate wealth of the living (whose estates would be subject to probate) is the product of the wealth actually appearing in probate returns, multiplied by the product of the factor α' into the reciprocal of the general death-rate (or the death-rate of a large group of ages, *e.g.* 15 to 85).

7. **Should the general death-rate be used?**—Before furnishing numerical results for comparisons, the questions may be considered whether R_0 may be taken as the general death-rate, or whether it should be the death-rate for the ages within the limits for which probate returns appear. These may be taken as from say 10 or 15 years of age upwards. The death-rate for the ages 0 to 9 and that for the whole of life in the State of Victoria are respectively :—

Death-rates, Victoria, 1908-1912.

Years.		1908.	1909.	1910.	1911.	1912.	1908-12.
Age-group, 0-9	Males	.0157	.0135	.0139	.0131	.0154	.0143
	Females	.0125	.0105	.0112	.0105	.0127	.0115
Whole of life	Males	.0144	.0130	.0128	.0127	.0134	.0133
	Females	.0110	.0099	.0102	.0104	.0111	0105

Being thus approximately identical throughout, there would apparently be no striking advantage in taking R_0 as the reciprocal of the death-rate for all ages from 10 years of age to the end of life; *it will probably be always sufficient to take it as the reciprocal of the general death-rate.* Later this point will be further discussed. The factor α' may be regarded as a correcting factor to a crude result obtained by multiplying the total wealth by the reciprocal of the general death-rate.

To compute a value of the factor α' or of the factor k', to be applied to "persons," it is obvious that in the former case we must take account of differences in the wealth contributed, and in the latter the differences both in wealth and death-rates. To compute this for persons, let α'_m denote the factor for males, α'_f for females, and α'_p for persons; Σw_m, Σw_f, and Σw_p the aggregate wealth, subject to probate, for males, females, and persons respectively; and R_m, R_f, and R_p the reciprocals of the death-rates for males, females, and persons respectively: then obviously the weighted result is :—

$$(13)\ldots\ldots \alpha'_p = (\alpha'_m R_m \Sigma w_m + \alpha'_f R_f \Sigma w_f)/R_p \Sigma w_p$$

$$(14)\ldots\ldots k'_p = (k'_m \Sigma w_m + k'_f \Sigma w_f) / \Sigma w_p$$

and these formulae will, of course, though only approximate, probably be sufficiently accurate for practical purposes. For strictly accurate results the values of α' and k' for "persons" should be determined directly, in the same manner as for males or for females.

8. **Estimation of the uncertainty in the values of the correction-factors.**—It is obvious from what has preceded that the results deduced from single years must be subject to a considerable margin of uncertainty. The irregularity of the appearance of large estates in the returns necessarily involves this, and the fact is perhaps more strikingly seen in the values deduced for the coefficients α' and k' which, it will later be shewn, are sufficiently accurate for the purpose in question :—

Victoria, 1908-1912.

Year.	Values of α'			Values of k'		
	Males.	Females.	"Persons."	Males.	Females.	"Persons."
1908	.338	.438	.332	23.3	39.8	26.1
1909	.427	.506	.420	32.9	50.9	36.7
1910	.363	.425	.359	28.3	41.7	31.3
1911	.440	.487	.427	34.6	47.0	37.1
1912	.415	.444	.405	31.0	40.1	33.1
Group Value, 1908-12	.3961	.4556	.3878	29.86	43.33	32.65
Average Value ..	.397	.460	.389	30.0	43.9	32.9

Since both these coefficients are independent of the *absolute* amount of the wealth revealed in probate returns, and α' is also independent of the absolute death-rate, it is clear that *for any one year these returns can afford only a very rough indication of the wealth possessed by the living.* Even quinquennial results are inadequate to furnish anything like a very exact estimate of the margin of uncertainty. In the absence of anything better, however, a deduction may be drawn by applying the theory of errors. If then the averages be taken (shewn in table) and the probable error of a single value and of the average is deduced by applying the usual formulae, viz. :—

$$(15)\ldots\ldots p = \text{probable error of single year} = 0.674 \sqrt{\left\{\frac{[vv]}{(n-1)}\right\}};$$

$$(16)\ldots\ldots p_0 = \text{probable error of } n \text{ years} = 0.674 \sqrt{\left\{\frac{[vv]}{n(n-1)}\right\}};$$

then the results are as follow, viz. :—

Range of Probable Error.	$a' \pm$			$k' \pm$		
	Males.	Females.	Persons.	Males.	Females.	Persons.
For the probable error of a single year	% .030=7.5	% .023=5.1	% .028=7.2	% 3.0=10.0	% 3.3=7.5	% 3.0=9.2
For the probable error of a mean of 5 years ..	.013=3.3	.010=2.3	.012=3.2	1.3=4.5	1.5=3.3	1.4=4.1

There are, no doubt, much larger "systematic" errors than these, viz., errors due to the tendency to make the element of estimate of value a "conservative one," but such errors cannot be readily determined, and their estimation is not a question of mathematical technique. Quite apart from this the *wealth deduced from the aggregate coming under review in probate in any one year is probably in error not less than* 7%, *even if the death-rate be taken into account, and not less than* 9% *if it be neglected*; and further, the mean of five years' results reduces these amounts respectively only to about 3% and 4%. Group-values for 10 years would probably be only 2% in error in either case, and the deduced result could be regarded as applying to the middle of the period.

9. **Cause of uncertainty in results.**—In order to see whether deductions of wealth from probate returns are entitled to much confidence, the effect both of the absolute amounts of the wealth in the returns, and the absolute values of the death-rates should be eliminated. To do this it will suffice to compute a table of values of u, viz., of the ratios of the wealth passing at any age to the total wealth passing, and also one of values of ρu, for a series of years, for which purpose the Victorian data for the years 1908-1912 are taken (see tables hereunder). Variation in the values of u is, of course, caused by the irregular appearance of large estates among probate-returns.

Even for a considerable population, the frequency with which very large estates appear in such returns will be irregular compared with that with which smaller estates appear. This is conspicuously shewn in any returns of the number of estates of different magnitude. We take an illustration from Prussian returns, the reason for obtaining which has now become manifest :—

Prussian Estates of Various Sizes, 1911.

	Size of Estate in Millions Sterling.					
Size of Estates ..	Over 5	Over 1·5 to 5	Over·769 to 1·5	Over·371 to ·769	Over·175 to ·371	Over·084 to ·175
Number of Estates ..	4	30	88	329	1,003	3,003
Relative Frequency ..	1	7½	22	82	251	751

It is at once obvious from this table that the falling in of very large estates through death will be rare; nevertheless, when it does occur, it will greatly prejudice the evaluation of the factors a and k for the year in question, since the ratio of $u = w/\Sigma w$ for some particular age-group will be greatly altered. Obviously we are not concerned with changes in the *absolute* amounts, but only in their ratio to the total, and this is what is shewn in the tables hereinafter. Similar remarks apply to variations of death-rate, but there is no reason to believe that these fluctuate greatly.

In the following table any effect due merely to variations in the absolute amount of wealth is eliminated as explained. The ratio of the wealth of each group to the total is expressed from year to year in the upper part of the table. In the lower part of the table is given the *product* of this ratio, into the ratio which the reciprocal of the death-rate of this group bears to the reciprocal of the general death-rate :—

Values of u and of ρu, Victoria, 1908-1912.

Age-Group.	MALES.						FEMALES.					
	1908.	1909.	1910.	1911.	1912.	1908–1912.	1908.	1909.	1910.	1911.	1912.	1908–1912.
	*VALUES OF u. (Total net value of probates for all ages =1).											
10-14 ..	000	000	000	000	000	0001	000	000	001	001	000	0004
15-20 ..	001	000	000	001	001	0006	002	001	001	001	001	0010
21-29 ..	006	015	005	006	006	0075	007	012	005	010	013	0093
30-39 ..	017	018	021	021	019	0191	031	042	052	030	027	0360
40-49 ..	053	081	064	093	069	0723	099	077	060	078	066	0746
50-59 ..	105	117	090	147	181	1298	101	182	095	199	123	1406
60-69 ..	170	241	223	212	186	2051	249	244	189	189	174	2041
70-79 ..	310	342	400	295	298	3269	282	255	435	319	409	3484
80-89 ..	315	176	188	215	222	2244	214	178	138	134	135	1553
90& over	023	010	009	010	018	0142	015	009	024	039	052	0303
	*VALUES OF ρu. (Total net value of probates for all ages =1).											
10-14 ..	001	000	000	001	001	0005	000	002	005	005	000	0025
15-20 ..	003	001	002	003	005	0028	007	003	002	007	002	0041
21-29 ..	021	056	017	021	021	0258	018	030	012	025	034	0243
30-39 ..	039	044	049	049	044	0449	060	077	096	055	057	0691
40-49 ..	065	103	082	140	092	0952	121	094	089	108	101	1014
50-59 ..	087	087	070	107	131	0981	088	171	079	163	099	1204
60-69 ..	059	080	075	064	061	0677	088	083	072	073	064	0745
70-79 ..	043	045	054	041	044	0454	039	034	061	042	062	0484
80-89 ..	020	012	013	013	016	0150	014	012	009	008	024	0099
90& over	001	000	000	000	001	0006	001	000	001	001	002	0009

* A decimal point is to be understood as preceding each of the values.

It will at once be seen how greatly the values for any age-group differ from year to year. Moreover, they differ considerably as between *localities*. The State of New South Wales is in most respects comparable to that of Victoria. Its population, social and economic progress, and racial characteristics are sensibly identical, and it might reasonably be expected that the values of u or of ρu would be identical for the two. But that the fact is far otherwise appears from the values given in the following table :—

Age-groups	10–14	15–20	21–29	30–39	40–49	50–59	60–69	70–79	80–89	90 & over
N.S.W. 1911 u (males) ..	000	001	007	027	077	175	243	343	119	009
Vict. 1911	000	001	006	021	093	147	211	295	215	010
Vict. 1908-12	000	001	007	019	072	130	205	327	224	014
N.S.W. 1911 (u) females ..	002	001	032	038	039	061	137	191	501	028
Vict. 1911	001	003	021	049	140	107	064	041	013	000
Vict. 1908-12	001	003	026	045	095	098	068	045	015	001
N.S.W. 1911 (ρu) males ..	003	002	021	059	094	114	076	043	007	000
Vict. 1911	000	003	021	049	140	107	064	041	013	001
Vict. 1908-12	001	003	026	045	095	098	068	045	015	001
N.S.W. 1911 (ρu) females ..	000	002	008	069	050	043	040	024	027	001
Vict. 1911	005	007	025	055	108	163	073	042	008	001
Vict. 1908-12	002	004	024	069	101	120	074	048	010	001

NOTE.—A decimal point is to be understood as preceding each of the above values.

The results shew that even for a community which may be supposed to be similarly circumstanced economically, an identical factor should not be assumed; for u, though independent of the absolute amount of wealth, and ρu both of the absolute death-rate *and* the amount of absolute wealth, vary considerably. The fact is, that *the proportion* of persons dying who contribute to the probate returns to the general population of the same age-group *is very variable*, viz., for the reasons above indicated.

These last tables reveal the fact that results from year to year materially differ and, since it is evident that the aggregate of *wealth* itself of the whole community does not fluctuate in this erratic way, the inference to be drawn is that, to secure anything like a reliable estimate, *the average for a number of years should be taken*, preferably, it is thought, *ten*, since that is long enough to include the ordinary periods of financial vicissitudes.[1] It has already been mentioned that Gini had noticed the effect of change in the mean duration of life upon the devolution-interval. A like remark applies also to the factor R, which is to be multiplied into the wealth contributed by each age-group of deceased persons. A careful examination of the evidence in the last three tables will shew an indication of progressive change with time. If the death-rate diminish, the factor R will increase. And here it may be stated that Australian mortality experience (1881-1890 and 1901-1910) shews the necessity of recognising that *no factor can be regarded as of constant value.* We now pass to the consideration of this point.

10. **Effect of change in the rate of mortality[2] upon the computation of private wealth.**—The change of the death-rate for almost every age-group in Australia is remarkable. This is seen in the following table :—

Values of R., viz., Numbers Living to 1 Dying.*

Exact Age.	Males—Australia.			Males—Q'land.			Females—Australia.			Females—Q'land.			Persons Eng.
	1886.	1896.	1906.	1886.	1896.	1906.	1886.	1896.	1906.	1886.	1896.	1906.	1911†.
0–5	23.9	28.5	37.4	21.6	29.8	39.3	26.8	32.5	43.8	24.2	34.3	45.6	24.4
5–10	254.5	329.6	452.1	249.0	294.1	451.7	284.9	344.8	499.0	302.7	323.2	495.0	312.7
10–15	394.3	439.8	517.6	352.4	444.0	495.5	419.8	517.6	566.9	452.5	565.0	625'8	522.0
15–20	188.0	271.0	328.3	‡63.1	162.0	270.6	253.2	315.1	375.1	202.1	409.8	434.4	549.9
20–25	126.7	187.1	247.3	‡48.8	116.9	191.8	168.2	224.6	270.4	123.5	256.8	285.9	313.3
25–30	115.0	152.5	208.9	‡65.5	107.2	167.2	129.0	170.7	213.4	105.1	173.0	222.2	241.2
30–35	112.2	134.4	178.3	‡72.9	104.2	144.2	118.5	139.8	178.4	108.1	145.2	179.3	
35–40	98.1	113.1	142.0	81.4	91.5	117.6	102.9	119.8	151.4	100.6	122.8	151.1	148.1
40–45	80.4	95.5	108.8	67.8	84.7	94.4	91.8	118.7	132.1	87.4	121.1	127.2	
45–50	62.5	76.0	82.6	54.5	70.0	72.4	79.4	99.6	116.4	81.7	102.4	112.7	78.4
50–55	47.4	57.3	64.2	44.4	51.5	55.4	64.1	77.7	93.5	71.5	76.9	91.0	
55–60	35.6	40.3	47.3	35.2	38.8	43.2	48.5	55.3	66.3	54.2	56.2	64.4	36.8
60–65	27.0	27.6	32.4	26.4	29.8	30.5	36.5	37.6	42.7	39.2	39.1	40.4	
65–70	17.8	18.9	20.8	19.2	20.2	20.0	22.3	26.2	27.2	26.7	26.9	26.1	17.2
70–75	13.2	13.8	12.9	14.1	14.3	13.9	16.5	17.1	16.4	18.8	18.4	18.3	
75–80	8.58	8.70	8.42	9.79	9.43	9.21	10.1	10.1	10.4	11.6	11.0	11.5	
80–85	5.89	5.70	5.74	6.70	6.54	6.26	6.19	6.51	7.07	7.28	6.99	7.31	
85–90	4.13	4.01	3.89	4.60	4.77	4.26	4.53	4.49	4.63	4.92	4.96	4.75	7.5
90–95	2.95	2.96	2.62	3.29	3.61	2.85	3.03	3.16	3.04	3.45	3.69	3.08	
95–100	2.11	2.10	1.79	2.21	2.81	1.91	2.23	2.08	2.01	2.28	2.25	2.03	
100–105	0.73	0.63	0.71	0.72	0.89	0.71	0.75	0.71	0.72	0.78	0.71	0.72	

* These are the numbers that must be multiplied into the wealth appearing in the net values in the probate returns for the age-groups in question. They depend upon 10-years' results, viz., 1881 to 1890, 1891 to 1900, and 1901 to 1910 inclusive.

† These depend upon 3-years' results, viz., 1910, 1911, 1912, and the population of 1911 only.

‡ The smallness of these numbers is due to the heavy death-rate for the ages in question. The Queensland climate was apparently inimical under the conditions of early settlement, but is now very satisfactory.

1. In a communication made by the writer to the Minister of Home Affairs of Australia, in February 1910, it was stated that ten years' experience would be necessary for a reliable basis for an estimate of this character. It will be seen that these results confirm that opinion.

2. This has been considered in the Appendix A to Vol. I. of the Report on the Census of the Commonwealth of Australia; see pp. 378-389.

The values of R are based upon the Life Tables prepared in connection with the 1911 Australian Census, and shew how very different these values may be for different States, those for Queensland being given by way of comparison with the values for the Commonwealth. They also show that the factors by which the amounts revealed in probate must be multiplied vary very markedly with time.

The results for the past 30 years may be very fairly represented by an equation of the form—

$$(17)\ldots\ldots R_t = R_0 + at$$

In the following tables the reciprocals of the death-rates are given by formulae of the above type :—

Secular Changes in the Reciprocals of the Rates of Mortality, Commonwealth of Australia, 1881-1912.

Age.	Males. Values of R*	Relative Weight for Probate. Vict. Experience. 1908-12.	Relative Weight for Probate. N.S.W. Experience, 1911.	Females. Values of R.	Relative Weight for Probate. Vict. Experience, 1908-12.	Relative Weight for Probate. N.S.W. Experience, 1911.
0–9 ..	$30.6+1.37\ t$	.0000	.0000	$33.1+1.77\ t$	.0000	.0000
10–14 ..	$339.7+1.45\ t$	.0001	.0004	$384.2+8.09\ t$	.0004	.0015
15–20 ..	$144.2+7.08\ t$	.0006	.0005	$205.7+6.30\ t$	.0010	.0005
21–29 ..	$83.7+5.52\ t$	.0075	.0066	$120.0+4.37\ t$	.0093	.0032
30–39 ..	$81.7+3.08\ t$	.0192	.0271	$85.9+3.23\ t$	.0360	.0383
40–49 ..	$66.2+1.11\ t$	.0723	.0771	$76.9+1.91\ t$	.0746	.0386
50–59 ..	$37.4+0.68\ t$	.1297	.1750	$48.2+1.16\ t$	.1406	.0613
60–69 ..	$20.3+0.22\ t$	.2051	.2425	$27.1+0.27\ t$	.2041	.1366
70–79 ..	$11.4-0.01\ t$	.3269	.3428	$13.2+0.02\ t$	.3484	.1912
80–89 ..	$5.5-0.01\ t$	.2244	.1191	$5.4+0.03\ t$	.1553	.5012
90 & over	$3.0-0.01\ t$	.0142	.0089	$3.0+0.00\ t$	.0303	.0276
		1.0000	1.0000		1.0000	1.0000

* NOTE.—$t = T-1880$, where T is the year for which the value is to be found.

If these are weighted according to the average wealth contributed in five years' experience (1908-1912) in Victoria, and one year's experience (1911) in New South Wales, the following results will be obtained, viz. :—

Change of R_0 with Time.

State of—	Males.*	Females.*	Persons.†
Victoria, 1881-1912 R_0 =	$21.12+0.3242\,t$	$28.14+0.5388\,t$	$22.6+0.368\,t$
New South Wales, 1911 R_0 =	$24.13-0.3867\,t$	$19.29+0.3536\,t$	$22.7+0.376\,t$

* Exact. † Approximate results only.

The result for persons has been deduced merely from the result for males and females by weighting according to the total wealth, or, what is the same thing, by the population and wealth contributed per individual; that is, it has been computed by the formula :—

$$(18)\ldots\ldots R_p = \frac{R_m W_m + R_f W_f}{W_p}, \text{ approximately only.}$$

These results, deduced from the death-rates for the Commonwealth, are applicable to the Commonwealth only on the supposition that the mean Victorian distribution of wealth according to age for the period 1908-1912 applies, or that New South Wales distribution in 1911 applies, as the case may be. The close agreement for "persons" is merely fortuitous, and the results differ sensibly for both males and females *owing to the very different distribution of wealth* according to age. At the present time the necessary information does not exist for a rigorously accurate computation applicable to the whole of Australia.

11. **Arithmetical example of effect of progressive change in death-rates.**—The effect of the variation in the death-rate can be made arithmetically apparent by adopting a known distribution and applying it to the reciprocals of these rates. For five-year age groups from 15-20, 20-25, etc., to 100-105, one smoothing of the results for males and females gave the following proportions in ten thousands, viz. :—

Males	6	27	53	83	130	279	463	616	744	890	1,124	1,462	2,086	1,392	495	123	26	1
Females	8	27	72	143	230	350	492	621	774	1,008	1,361	1,701	1,532	967	466	188	57	3

These, multiplied by the reciprocals of the group death-rates, gave the following results, viz., those in the left-hand side of the table :—

Variations in the Values of k' and a', through Changes in the Death-rates, Australia.

Year.	VALUES OF k'				VALUES OF a'			
	Commonwealth.		Queensland.		Commonwealth.		Queensland.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
1886.0	24.29	32.45	21.77	37.96	.4024	.4438	.4213	.5574
1896.0	26.20	37.73	24.88	39.01	.3749	.4358	.3539	.4112
1906.0	29.52	43.25	26.94	42.79	.3666	.4288	.3265	.3769

These quantities (on the left-hand side, k', see formula 9) are the factors—if the distribution of the total wealth in each age-group be as supposed, which, multiplied into the aggregate wealth appearing in any probate return, give the aggregate of the wealth of the living of all ages taken together. The quantities on the right-hand side are also factors, but must be multiplied by the reciprocal of the general death-rate. The quantities on the right-hand side are the values a', which, when multiplied by the reciprocals of the death-rates (of males, females, or persons as the case may be). The quantities k' and a' can be used with death-rates for ages 15 to 85, the important period of life as far as probates are concerned, or ages 15 to 105, or yet again, 0 to 105, that is to say, the ordinary crude death-rates. Inasmuch as these last are always the most readily available, it is preferable to adopt them.[1] The values of both k' and a' are given in the table above for the Commonwealth and for Queensland, because the progression of the death-rates was so entirely different in the two cases, and this is reflected in the results, although the distribution of wealth is assumed to be identical.

1. The average over a quinquennium or a decennium will always be sufficiently accurate, as is abundantly manifest from the following results for the Commonwealth :—

Males	1886.0	1896.0	1906.0	Females ..	1886.0	1896.0	1906.0
Average of rates	16.597	14.318	12.453	..	13.703	11.578	9.945
Decennial rate ..	16.565	14.298	12.426	..	13.677	11.553	9.920
Census rates 0-105	16.564	14.299	12.416	..	13.678	11.550	9.915
,, 15-105	15.213	13.844	12.997	..	11.467	10.521	10.136
,, 15-85	14.894	13.436	12.478	..	11.186	10.149	9.625

These death-rates are expressed per 1,000 of the same sex.

12. **Correction to reduce group-results to results given by a continuous curve.**—We have seen that if the whole population be treated as a single age-group, the error is so great that we get the correct result only after multiplying by about 0·4. If we treat the whole of the wealth as belonging to persons of 21 years of age and upwards, which is substantially true, the factor of correction becomes about 0·5, that is, it is slightly nearer unity. It is, of course, also true that even a ten-year group will not give a theoretically faultless result, since the smaller the group the more accurately will the facts be represented, inasmuch as, in their ideal form, the curves of variation of wealth with age, and of death with age, must be regarded as continuous. In the nature of the case, group-methods are, of course, only approximate, and before adopting them it is necessary to inquire whether the error, consequent upon the adoption of a group of any particular size, is negligible or not. It has already been shewn that the error of ten-year groupings is very small in comparison with the uncertainty of the data, and it may be added that five-year age-groupings might well be regarded as rigorously exact. We shall consider first the question of the error of ten-year age-groupings, and shall deduce a factor of correction which will probably be sufficiently exact for ten-year groupings in other countries.

The rigorous solution can be developed in the following form. Put

$$(19)\ldots\ldots \rho = R/R_0 = f_1(x);\ u\delta x = \delta W/W = f_2(x)\,\delta x$$

$\int f_2(x)\,dx$ thus being unity between the limits of age comprised, say, 10 to 105, or if we prefer it from age 0 to the end of life. Then

$$(20)\ldots\ldots \delta \mathbf{W} = R\delta W = RWf_2(x)\,\delta x = R_0 W f_1(x)\, f_2(x)\,\delta x;$$

consequently

$$(21)\ldots\ldots \mathbf{W} = R_0 W \int \rho u dx$$

the limits being the extreme ages in question.

By graduation of the curves ρ and u for yearly values it was found that for "males," "females," and "persons" this last expression gave correcting factors of about 0.9873, 0.9817, and 0.9858 respectively, instead of unity, to be applied to the group-results adopted (viz., about 10 years) to reduce them to what would be given by 1-year groups, and further, a factor of about 0.9997 to reduce them to what would be given by infinitesimal groups, *i.e.*, by 0.9870, 0.9814, and 0.9855 respectively. That is, the group-results for "persons" should be multiplied by 0.9858 x 0.9997 = 0.9855, and similarly for males and females. That is, the group-results for "persons" require to be multiplied by say 0.986. If, however, only 1.4% be allowed to partially (or wholly ?) compensate for a defect due to the wealthier classes possibly living—as has been supposed—somewhat longer than the average, then no correction need be applied, and the group-result may be regarded as correct. It will, however, be decidedly preferable to retain the reduction and consider the other question independently.

Five-year groupings would require reduction by factors 0.9967, 0.9954 and 0.9963 for "males," "females," and "persons" respectively to reduce to infinitesimal groupings.

We now consider the question of the possible magnitude of a correction for variations in the death-rate with wealth.

13. **Correction in any age-group for variation of wealth with death-rate in the group.**—If in any age-group it should happen that the death-rates have any systematic relationship to the wealth of the classes within the group, then the assumption that the dying represent the living is not quite correct. This question may be presented in several ways. First, let us suppose that the people of any limited age-group, divided into classes according to wealth possessed, have characteristic death-rates according to class. Then the aggregate of wealth W of the entire group would be made up of the wealth W', W'', etc., of the classes. And, similarly, the aggregate of the wealth (w) of the dying would be made up of w', w'', w''', etc., the amounts accruing by the deaths in the several classes. Then obviously we have :—

$$(22)\ldots\ldots W = W' + W'' + \text{etc.} = R'w' + R''w'' + \text{etc.} = \lambda Rw$$

where R is the reciprocal of the death-rate for the whole, and R', R'', etc., are the reciprocals of the death-rates of the several classes. Thus it is also immediately evident, on dividing both sides of the preceding equation by Rw, that

$$(23)\ldots\ldots\lambda = \frac{R'}{R}\cdot\frac{w'}{w} + \frac{R''}{R}\cdot\frac{w''}{w} + \text{etc.}$$

that is, λ *is the sum of the products of the relative death-rate of the class* (as compared with that of the age-group as a whole) *into the relative wealth of the class*, that is its ratio to the wealth of the whole group.

Or again, writing R_0 for λR, we have for R_0, the proper reciprocal to use as multiplier, the weighted mean of the reciprocals of the death-rates, viz. :—

$$(24)\ldots\ldots R_0 = \lambda R = R'\cdot\frac{w'}{w} + R''\cdot\frac{w''}{w} + \text{etc.}$$

This formula indicates that the process is exactly analogous to that of forming groups according to age, and it may be also observed that the remarks regarding the adoption of a continuous method also apply in their due measure. There would, however, not be the same necessity to form small groups, since the distribution of death-rate according to wealth will not, at the outside, have wider limits than from 1 to 2, and, furthermore, is itself very questionable. We may state the whole matter in other terms, as follows :—

The assumption that the persons dying in any age-group represent the living may possibly be defective in two particulars, to which reference may now appropriately be made. First, the frequency of death among the section of the community with estates sufficiently large to come under review for probate may perhaps be less than the average on account of their better financial ability to secure themselves against adverse influence. In some countries this is unquestionably the case, but in Australia the favourable climatic conditions would probably minimise such a consequence. Unquestionably, no assumption one way or the other can be made with safety. Of course, if death *is* less frequent among the rich, there will be larger numbers of rich persons living than is implied by dividing by the *average* death-rate (or multiplying by its reciprocal), and the result found without regard thereto, viz., ($Rw/\Sigma w$) will be too small ; *i.e.*, R must be multiplied by a factor somewhat greater than unity, $1 + \zeta$, say, that is $\lambda - 1 = \zeta$, if this were the only thing to be taken into account ; see formula (23).

On the other hand, those whom death eliminates at any age are evidently differentiated vitally from those who remain, and the question arises whether this greater vital endowment is characterised on the average by greater endowment of

wealth. If it be so, then it follows that the wealth factor ($u = w/\Sigma w$) should be increased, *i.e.*, it should be multiplied by a quantity somewhat greater than unity, $1+\eta$, say, or if this were the only matter to be taken into account, $\lambda - 1 = \eta$.

Hence the total result must be multiplied by the product of those factors, viz., by $(1+\zeta)(1+\eta)$. In other words, the result is perhaps more properly indicated by the expression

$$(25)\ldots\ldots W = R(1+\zeta)\frac{w(1+\eta)}{\Sigma w} = (1+\xi)R\frac{w}{\Sigma w}, \text{ say.}$$

These two correction-factors are similar in kind, and in fact can hardly be regarded as distinct, forasmuch as the supposition that the living in any age-group may be differentiated from the dying in respect of wealth may be regarded as including also the differentiation in mortality due to wealth. Both may, therefore, be embraced under one factor, say $(1+\xi)$, where ξ is sensibly equal to $\zeta+\eta$ (forasmuch as $\zeta\eta$ may be considered negligible); thus we may assume that $\lambda - 1 = \zeta + \eta = \xi$. Unfortunately no satisfactory data for the determination of these factors exist, and at present we can safely infer nothing in regard to them, nor even obtain a rough idea of the magnitude of their joint effect.

If we suppose that each age-group is divided into classes corresponding to individual wealth, and that the death-rate has been ascertained for each, and suppose also that the range of wealth in each class is not very large, any correction of the type of η for any class in question will necessarily be negligible, and the correction may then be regarded as of the type of ζ. Remembering that the sum of the factors w'/w, w''/w, etc., is unity, we may put formula (23) in the following form, viz.:—

$$(26)\ldots\ldots \xi = \frac{w'}{w}\cdot\frac{R'-R}{R} + \frac{w''}{w}\cdot\frac{R''-R}{R} + \text{etc.}$$

which shews that the correction depends on the *proportion* of the wealth contributed by each class to the total, and the *relative* difference of the mortality rates. Since R necessarily lies between the least and greatest values of $R'\ldots\ldots R^N$, some of the quantities will be negative and some positive.

14. **Difference of death-rate not determinable from relative number of deaths in probate and non-probate classes.**—We may note first of all that the existing returns do not afford the means of deducing the death-rate even of two such crucial divisions as the non-probate and probate classes of the population. For the data are:— P; r; $d = d' + d''$; those symbols denoting respectively the total population of an age-group, the death-rate, the total deaths, those of the non-probate class, and of the probate class respectively, the total deaths being equal to those in the two classes. Suffixes may be added to denote the successive age-groups.

If we assume a rate r' corresponding to d', the corresponding population P' is determined; and $P''\,(=P-P')$ gives with d'' the death-rate r'', while r is obviously in no way affected. Or if we assume relations such as $r' = \beta r$, then we have $P' = d'/\beta r$. Or again, if we make $r'' = \gamma r$, that is, equal to $\gamma d'/P' = d''/P''$ we have at once $\gamma d'/d'' = P'/P''$, and we can divide P in this ratio.

The same can be done, of course, for each age-group. As there is no valid reason, however, for assuming the values of β or γ, we can infer nothing in regard to the division of the population into non-probate and probate classes.

15. **Variation of mortality in age-groups according to occupation.**—The attempt was made to ascertain whether " occupation," as determined at a Census, would throw any light upon the uncertainty arising through possible differences in the rate of mortality according to wealth-classes. The result of the analysis is as follows :—

For the Commonwealth of Australia and for the years 1908-1912 the *relation of death-rate to class of occupation of males*, according to age-groups, was found to be as indicated in the following table :—

Ratio of Rate of Mortality in each Class of Occupation to the Rate for the Total Male Population in the same Age-group, Australia, 1908-1912.

Age Group.	Ratio to Death-rate of Males in same Age-group for each Class of Occupation.						
	Primary Producers. VI.	Professional. I.	Commercial. III.	Transport and Communication IV.	Industrial. V.	Domestic. II.	Death Rate.
15–19 ..	.40	.74	.65	.92	1.19	.70	.0027
20–29 ..	.65 Av	.80 Av	.92 Av	1.10 Av.	1.33 Av.	1.01 Av.	.0039
30–39 ..	.69	.88	.97	1.03	1.35	1.38	.0057
40–49 ..	.69 .67	.83 .84	.90 .91	.95 1.01	1.39 1.40	1.61 1.28	.0099
50–59 ..	.65	.84	.93	.94	1.44	1.33	.0178
60–64 ..	.69	.85	.84	1.01	1.50	1.09	.0306
65 & over	.88	.96	.56	1.20	1.57	.81	.0928
All ages	.83	.91	.76	.83	1.38	1.26	.0119

The "primary producers" (VI.), with the lowest death-rate, include persons engaged in agriculture, dairying, pastoral pursuits, forestry, fisheries, water conservation and mining. The "professional" class (I.), also with a relatively low death-rate, includes all persons engaged in government, law and its administration, health, religion, charity, education, science, and amusement. The " commercial" class (III.), also with a death-rate under the average, includes all persons engaged in banking, finance, and in the sale and storage of commodities. The class "transport and communication" (IV.), which has a death-rate about the average, consists mainly of employees of the railway and postal departments, and all persons engaged in the carrying trade, whether by land or water. The "industrial" class (V.), with a death-rate distinctly above the average, comprises persons engaged in manufacturing industries, in the building trade, and in the construction of rail and road ways, bridges, and similar things. The "domestic" class (II.), with the highest death-rate of all, includes all engaged in the supply of board and lodging, as well as all engaged in other domestic occupations.

It is evident on consideration that the correlation of wealth and death-rate is not on all fours with that of occupational class and death-rate, and, moreover, it is also evident, from the arithmetical nature of the case, that the more frequently instances of wealth appear among the different occupational classes the more will the relation between wealth and rate of mortality tend to equalise. Thus, for group-results of sufficient magnitude, we may suppose that the marked differences of death-rate shewn in the table are, in the correlation of wealth and mortality, considerably reduced, and, as a not wholly improbable assumption, may accept for a supposititious computation the correlation shewn in the table hereinafter between wealth and death-rate.

16. **Life Assurance Society's experience of variations in death-rates, according to size of policy, etc.**—The experience of the Australian Mutual Provident Society and of the Scottish Widows' Fund throws some light on the question of the relation of wealth and mortality, and has consequently been considered. We remark first that the possible variation to be expected in death-rates for any age-group may also be roughly gauged by referring to the A.M.P. experience for the period 1849-1903. Instead of considering a number of age-groups we may consider the large group for the ages 20 to 59 only, and the same age-group for the Commonwealth for males for 1891-1900. The results are as follow :—

Whole Life Assurances ..	Healthy .00723	Loaded .01053	Factor 1.46
Endowment „ ..	„ .00468	„ .00652	„ 1.40
Commonwealth Male Death Rate ..	.01095		

This gives us some idea of the range in the rates of mortality. It is not, however, in the *range* in an age-group that we find what is essential. It is the *average variation with wealth* ; some slight indication as to this is to hand in the report on the Mortality Experience of the Australian Mutual Provident Society for the 40 years 1849-1888, by Mr. Richard Teece (see pp. 42-43).

Rate of Mortality per 10,000.

Age Group.	Assurance.		A.M.P. Society.		Scottish Widows' Fund.	
	Under £500	£500 to £1000	Under £1000	Over £1000	£500 and under.	Over £500
25–29 ..	40	43	41	30	51	36
30–34 ..	49	47	48	49	59	42
35–39 ..	60	67	62	60	76	60
40–44 ..	76	93	82	68	98	76
45–49 ..	94	104	98	109	110	90
50–54 ..	117	139	125	137	145	136
55–59 ..	148	165	154	181	239	202
60–64 ..	221	245	229	231	323	314
65–69 ..	379	447	405	438	440	435
70–74 ..	530	427	486	577	697	675
75–79 ..	734	881	813	1027	965	971

It will be seen that these results are by no means unequivocally in favour of the assumption that (at least as far as the class insuring is concerned, probably the thriftier class) mortality-rates are in favour of the wealthier section.

On page 41 of the same report it is stated that in America "the heavier rate of mortality prevails among lives assured for *large* sums," though in Great Britain and Europe the contrary is the case. On the experience of the Scottish Widows' Fund, 1835-1884, G. C. Stenhouse says, that in general " the mortality *decreases* as the sum assured *increases*."

In Part II. of the same report, pp. 13-14, Mr. Teece suggests "that in the United States and these Colonies" (the Australian States) " men with sufficient means to assure for large sums are those who are actively engaged in business, and who are annoyed, harassed, and impaired in health by the vicissitudes attendant on business pursuits in young countries, while the corresponding class in Great Britain is composed chiefly of men of leisure . . . . enabled to lead comparatively tranquil lives . . . . which tends so greatly to prolong life."

In the face of the preceding evidence, *a priori* judgments as to the correlation between wealth and mortality must be regarded as of little value, and in any case it is quite certain that the occupational class "primary producers," with the lowest rate of mortality, contains an immense majority who are certainly by no means wealthy. We have thus shewn not only that we are not entitled to regard the whole occupational variation of death-rate as applying to the wealth-variation (since occupations characterised by a high rate of mortality are among those which are also characterised by considerable wealth), but also that the experience of life insurance in Australia lends no real support to the view.

17. **Estimate of possible correction based upon supposititious distributions of wealth and mortality.**—The probate-returns shew that for Victoria in the years 1908-1912 the distribution of wealth averaged as follows :—

Average Distribution of Estates According to Net Value, Males, Victoria, 1908-1912.

Range of Value.	No.	Net Value. £	Average Value. £	Relative No. (Unit 2814)	Relative No. (Unit 8488.2).	Relative Value (Unit £6,020,147)
Excluded ..	5674.2	Unknown	..	Excluded	.668	.00000
Under £100..	438.8	19,079	43.5	(A) .155	(B) .052	.00317
£100-£300 ..	626.2	117,260	187.3	.223	.074	.01948
£300-£500 ..	384.6	151.743	394.5	.137	.045	.02521
£500-£1000 ..	424.6	308,429	726.4	.151	.050	.05123
£1000-£3000	533.8	936,719	1754.8	.190	.063	.15560
Over £3000..	406.0	4,486,917	11051.5	.144	.048	.74531
Total ..	2814.0 8488.2	6,020,147	..	1.000	1.000	1.00000

The proportions of the number of estates of various magnitudes to the total number coming under review for probate are shewn in column (A) in the table for males only. Many estates do not come under review at all, on the average about 5700, if everyone dying is regarded as possessed of some wealth. Hence, since ordinary statistics yield the death-rate for the entire age-group only, it is necessary that these should be entered as persons the wealth of whose estates, so far as the present element of the inquiry goes, is zero. In this way the proportions shewn in column marked (B) are obtained.

We see from this table that the distribution of size of estate follows a curve of the hyperbolic type, and from the table of mortality according to occupation that, for practically any age-group which seriously affects the result, the relative mortality of the different occupations ranges between about 0.6 or 0.7 to about 1.5. Unfortunately, however, there are no available data for correlating the two results, and consequently ξ (or λ) cannot really be ascertained. It remains, therefore, to formulate some plausible supposition, and to ascertain what the value of this correcting factor would be if such supposition were really applicable. This will give at least a very rough indication of the *extent of the uncertainty* in any deduced result which neglects the correction.

Although, as pointed out, no definite correlation between occupation and wealth has been ascertained, we shall nevertheless assume for our purpose that a somewhat analogous range of variation of death-rate applies to differences of wealth possessed ; the assumption being arbitrarily based on the general but very uncertain ground

that financial resources can command a degree of comfort and attention that conduce to longevity. The difference between moderate and considerable wealth, if it really be in favour of the latter, can however be only very slight. Thus, with some exceedingly slight degree of plausibility, it may be supposed that the persons of zero wealth have the highest mortality-rate (or lowest factor R), and those of the greatest wealth the lowest mortality-rate (or highest factor R).

It should be noted that the ratio $(R'-R)/R$ is independent of the absolute value of the death-rate, and the ratio w'/w is similarly independent of the absolute amount of the wealth of each class within a group; further, the relative numbers in each class are necessary only to ensure that the weighted mean of the death-rate gives the general death-rate. Hence, we may regard the above table as a possible representation of the existing facts, even if not a probable one.

Having regard to every aspect of the matter, it is likely that the variation of death-rate with wealth, *if it exist at all*, does not pass through a wider range than say 1 to $1\frac{1}{3}$ or 1.064 to 0.798. Thus, taking into account the relative numbers in each class, the relative reciprocals of the death-rates may be (arbitrarily) assumed to be those shewn in the following table, line i. being taken from the preceding table :—

	Relative Numbers only.							Total or Mean.
Value of Estates, Total i.	.000	.003	.020	.025	.051	.156	.745	1.000
Number of Estates ii.	.67	.05	.07	.05	.05	.06	.05	1.00
Values of reciprocals of death-rates, relative iii.	.94	.99	1.04	1.10	1.15	1.20	1.25	1.00
Products of i. and iii.*	.0000	.0000	.0009	.0024	.0076	.0314	.1885	.2308

* The difference of iii. from unity only has been used.

The values in top line may thus be taken as those of w'/w, and the difference between the values in line iii. and unity as the values of $(R'-R)/R$, etc. Thus the value of this factor, viz., $\lambda-1$ or ξ, is the algebraic sum of the products of line i., the top line, by these differences. This gives the result $\xi = +\ 0.2308$, a proportion which, of course, is serious. It is evident from the table that the result depends almost wholly on the difference from the mean of the death-rate of persons possessing the large estates; since neglecting all whose estates are under £3000 the result would have been $\xi = +\ 0.1885$. It is thus quite clear that the death-rate of those who are the main contributors to the probate wealth-returns profoundly influence the results, and here it may be observed that the death-rate of so restricted a class must vary greatly from year to year; indeed, a determination for a period of anything less than 10 years is probably of small value. In any case it is to be observed that it is unsafe in the light of the available evidence to *assume* the death-rate of the wealthy in any age-group differs systematically from the death-rate of the entire group. It must be based upon statistical evidence before it can be admitted.

18. **Consequence of assuming that life assurance rates should be adopted.**—It has been suggested by Mr. A. M. Laughton, Government Statistician of Victoria, "that the mortality-rates amongst property owners will correspond with the rates relating to assured lives as given in the published experience of the Australian

Mutual Provident Society" (Victorian Year Book, 1912-13, pp. 270-271). Regarding this it may be said that the experience of a large assurance company necessarily includes a very large body of recently selected lives, and although the A.M.P. experience, which has been used, dates back to 1849, the number of policies issued in the earlier years of the Company's history was so small, compared with the number issued in more recent years, that the experience may properly be regarded as one in which medical selection had played a very prominent part. The effect produced by this cause is that a rate of mortality shewn is much lighter than that experienced by a similar body of lives not subject to medical selection, and consequently for the purpose in view the A.M.P. rate must be considered as being probably unduly favourable, and as giving too high a multiplier.

It is, moreover, for reasons already pointed out, by no means certain or even probable that the possession of wealth and acceptance as a satisfactory life by an insurance office are coincident facts, or that the " healthy-life" experience of an insurance office is to be considered as applicable *only* to the wealthy. The significance of the A.M.P. mortality rates for healthy and loaded lives appears in the following table of the *reciprocals* of those rates (or rather the values of q_x) which will be sufficiently near for the purpose. These are, of course (approximately) the factors to be employed. They are given for the ages 25, 35 . . . . 95, viz., the central ages of the more important groups (see A.M.P. Report on Mortality Experience, 1849-1903).

Reciprocals of q_x (Males) A.M.P. Society, 1849-1903, and Australia, 1881-1890, 1901-1910.

Age.	Relative Weight.	Whole Life.		Endowment.		Australia.	
		Healthy.	Healthy and Loaded.	Healthy.	Healthy and Loaded.	1881–1890	1901–1910
25	.008	278	270	272	258	116	223
35	.019	193	176	224	213	105	158
45	.072	124	113	140	131	70.2	92.3
55	.130	69.4	64.4	77.5	78.7	40.4	55.1
65	.205	29.0	27.2	..	..	21.8	25.9
75	.327	14.0	12.7	..	..	10.8	10.4
85	.225	5.2	5.4	..	..	5.3	5.1
95	.014	1.7	1.7	..	..	3.0	2.1

The column, " relative weight," shews the mean for the years 1908-1912 of the net wealth contributed by the successive probate groups, and is probably sufficiently accurate for the period 1901-10. We indicate the difference according to the general values in the two last columns. These results are as hereunder :—

Taking the reciprocals of the average death-rates for the period 1901-1910 as a basis, the results would be :—

A.M.P. Mortality of healthy males (1849-1903) would give the 1901-1910 result multiplied by 1.2481

A.M.P. Mortality of healthy and loaded males (1849-1903) would give the 1901-1910 result multiplied by 1.1576

Actual Mortality Australia, 1881-1890, would give the 1901-1910 result multiplied by 0.7885

Taking the reciprocals of the average death-rates for 1881-1890, the results would be :—

A.M.P. Mortality of healthy males (1849-1903) would give the 1881-1890 result multiplied by	1.5828
A.M.P. Mortality of healthy and loaded males (1849-1903) would give the 1881-1890 result multiplied by	1.4681
Actual Mortality Australia, 1901-1910	1.2682

In view of the fact that the value of $1 + \xi$ was found to be about 1.1490, *on the suppositions made*, and that the result based on the 1901-1910 mortality, compared with the A.M.P. experience of (1849-1903) for "healthy and loaded male lives," gives 1.1576, it might perhaps be assumed that a correction-factor of 1.15 is probably justifiable. This, however, I do not believe to be the case. *It would be so only if the assumption referred to had any validity.* After a wide review of the question, and in the light of all the available evidence, it seems that in Australia at any rate, there is grave reason to doubt the existence of a definite correlation of wealth and longevity, and, if so, *the supposition* by means of which ξ was estimated above *has no validity. It is certainly not based upon evidence*, and rests merely upon a more or less plausible assumption, against which, as has been shewn, there is at least some evidence.

We now indicate the numerical consequences of a difference in the mortality rates of classifications according to wealth within the same age-group

19. **Consequence of death-rate being less among the wealthy.**—Suppose that the population at any age is divided into two classes differing in wealth, and that the wealthy experience a lower rate of mortality than the less wealthy. This will have the effect of altering the distribution with the lapse of time (when the transfer of the survivors of any age-group to a group of greater age is considered). It will follow as a consequence that the aggregate of the wealthier classes will tend to relatively increase with age as compared with the aggregate of the less wealthy class, other things being equal. Other consequences will also follow, which we shall now proceed to consider. We shall assume that :—

(i.) The average unit of wealth is w' for the poorer sub-group ; and $w'(1+u')$ for the richer sub-group ;

(ii.) That this unit does not increase with time, or if it does increase, that it increases with time always by the same ratio whether the amount be large or small ;

(iii.) That the death-rate for the poorer sub-group is r, and for the richer $(r-h)$, where h is a positive quantity.

The following propositions follow as a necessary consequence of these three assumptions :—

(a) Since by hypothesis the numbers of the poorer sub-group are decreasing more rapidly than those of the richer sub-group, the ratio of the numbers dying with large estates (or paying probate) to the number dying with small estates (or who do not pay probate) should *tend* to be an *increasing* ratio.

(b) Since by hypothesis the individual wealth of the persons remaining alive is unaltered, and, owing to the greater death-rate of the poorer sub-group there are relatively fewer in that group, the average for the combined sub-groups must *tend* to increase with age.

(e) Since by hypothesis the individual wealth is the same, and death has more rapidly decreased the poorer sub-group than it has the richer sub-group, the ratio of the aggregate possession of the latter to the former will be an increasing ratio.

These results are perhaps seen more clearly when set out formally (algebraically). In the table hereunder m denotes the numbers in the poorer sub-group, and n those in the richer, the death-rates being respectively r and $(r-h)$. After a unit of time the groups are reduced by death to $m(1-r)$ and $n[1-(r-h)]$ respectively, and the aggregate of wealth will be as shewn in the table hereunder, provided we suppose *that the wealth does not pass by death to persons in the same age-groups.* The processes by means of which the various quantities are obtained are obvious.

Epoch.	Numbers. I.	Numbers. II.	Ratio of Numbers. II. to I.	Wealth. I.	Wealth. II.	Ratio of Wealth. II. to I.	Average.
Living Initially	m	n	$\frac{n}{m}$	$mw' + nw'(1+u')$		$\frac{n(1+u')}{m}$	$w'\left(1+\frac{nu'}{m+n}\right)$
Living after unit time	$m(1-r)$	$+n(1-r+h)$	$\frac{n}{m}\left(1+\frac{h}{1-r}\right)$	$m(1-r)w' + n(1-r+h)w'(1+u')$		$\frac{n(1+u')}{m}\left(1+\frac{h}{1-r}\right)$	$w'\left(1+\frac{nu'}{m(1-\eta)+n}\right)$ where $\eta=h/(1+r-h)$

The above, however, represents only the effect on the *living.* We can establish the case for the *dying* in a similar way.

Let the persons in the two classes, each individual possessing respectively w' and $w'(1+u')$, be again m and n; and the respective death-rates initially r_1 and r_2. Then the average wealth, when a unit of time has elapsed, will be :—

$$(27)\ldots\ldots w'_0 = \frac{\text{Total wealth of dying}}{\text{Number dying}} \equiv \frac{mr_1w' + nr_2w'(1+u')}{mr_1 + nr_2} = w'\left(1+\frac{nr_2u'}{mr_1+nr_2}\right)$$

If, then, we suppose that r_1 and r_2 change with time in the same ratio, say become ur_1 and ur_2 (therefore that they preserve the same ratio to each other) then we have :

$$(28)\ldots\ldots w'_1 = \frac{\text{Total wealth of dying}}{\text{Number dying}} = \frac{m(1-r_1)\mu r_1w' + n(1-r_2)\mu r_2w'(1+u')}{m(1-r_1)\mu r_1 + n(1-r_2)\mu r_2} = w'\left(1+\frac{nr_2u'}{mr_1\frac{1-r_1}{1-r_2}+nr_2}\right)$$

and if, as we previously supposed, r_2 be less than r_1, the fraction $(1-r_1)/(1-r_2)$ will be less than unity, thus *the wealth-average will become greater.*

It is important to observe that the expressions (27) and (28) cannot be used with any great assurance to *deduce* values of r_1 and r_2, because they represent, after all, very small changes. We shall illustrate this point by considering a numerical instance.

The death-rate for the age-group 60 to 70 for "persons" is about 0.034. Suppose then that we assume r_1 is about .04, and r_2 about .02, and that the ratio of m to n is as 3 to 2 (which is about the proportion of the non-probate class to the probate class). Then in these two last expressions we should have :—

$$w' \left(1 + \frac{2 \times 0.02\ u}{3 \times 0.04 + 2 \times 0.02}\right) = w' (1 + 0.25\ u')$$

$$w' \left(1 + \frac{2 \times .02\ u}{3.\frac{0.96}{0.98}\ 0.04 + 2 \times .02}\right) = w' (1 + 0.253886\ u').$$

It will be seen that the influence is extremely small [1] for even so great a difference of r_1 and r_2 as is implied in the ratio 2 to 1. It is moreover evident that so small a quantity could be easily masked by other elements affecting the results, viz., changes in the rate of accumulation of wealth, irregularities in the deaths, in the sizes of estates coming under review, and so on; in fact, it goes far to shew that no analysis of the respective numbers or of the respective amounts appearing in age-groups is likely to lead to anything definite, either as to relative mortality among the non-probate and probate classes, or as to the possible rate at which the wealth of either actually grows.

In the preceding table showing symbolically the averages for the living at the commencement and end of a period, the results, on the basis supposed, would be respectively $(1+0.40\ u')$ and $(1+0.041517\ u')$, so that the difference between the beginning and end of a period will be relatively very small, and the conclusion drawn equally applies, for although u' may be large the *relative* changes therein will be small.

20. **Existing statistical data point to the conclusion that the devolution-rate method must be applied to each sex separately.**—The returns of Victoria for 1908-1912, given in the table hereunder, shew that there is a remarkable constancy in the ratio of the number of the non-probate to the probate class, from 40 to 90 years of age for both males and females, and certainly to somewhat regular changes in the average wealth in each age-group, but, as already pointed out, nothing can be deduced from this table in regard to the relative death-rates of the probate and non-probate classes. Column (7), showing the wealth per head of the dying, reveals a marked increase with age, the maximum being, for males, in the group 80-89, and the maximum for females in the group 70-79. This difference shews, of course, that the factors a and k will differ for the sexes. Other striking features of difference are that the wealth per head is roughly between three and four times as great for the males as for the females, and that the ratio of the non-probate to the probate class differs materially. The conclusion is *that separate returns should be made out for males and females*, and, in computations of total wealth, that formulae (3) to (12), and (19) to (28) cannot be applied to the sexes taken together on the assumption that they may be considered as forming a homogeneous population. The same observation is accentuated by the character-

1. If $u' = 0$, the ratio of the lower quantity to the upper is 1.0; if $u' = 1.00$, the ratio becomes 1.0031; if infinity, it becomes 1.0155.

istic difference in the death-rates. From this it follows that, *in order to deduce accurate results, we must, in the application of the devolution-rate method, treat the sexes separately*, and not attempt to combine them so as to calculate results for "persons" merely. This dictum will be confirmed by a study of the table hereunder :—

Aggregates from Probate Returns, Victoria, 1908-1912, and also for 1913-1915.

Age-Group.	Deaths.		Ratio of No. of Non-Probate to No. of Probate.	Total Dying.	Aggregate Net Wealth.	Wealth per Head of Dying.	Average Net Value per Estate.
	No. of Persons Dying Less No. of Estates in Probate Returns.	No. of Estates in Probate Returns.					
(1)	(2)	(3)	(2)÷(3) (4)	(5)	(6)	(6)÷(5) (7)	
Males					£	£	£
Under 15	**10,323***	**9**	**1147.0**	**10,332**	**1,978**	**0.191**	**220**
	6,622*	3	2207.3	6,625	1,662	0.251	554
15 to 20	**996**	**62**	**16.06**	**1,058**	**16,066**	**15.19**	**259**
	589	45	13.09	634	9,922	15.65	220
21 „ 29	**1,475**	**424**	**3.48**	**1,899**	**212,565**	**112**	**501**
	969	351	2.76	1,320	175,562	133	500
30 „ 39	**1,629**	**790**	**2.06**	**2,419**	**541,445**	**224**	**685**
	1,040	545	1.91	1,585	481,916	304	884
40 „ 49	**2,395**	**1,680**	**1.43**	**4,075**	**2,045,368**	**502**	**1,217**
	1,336	1,034	1.29	2,370	1,044,699	441	1,010
50 „ 59	**2,489**	**1,850**	**1.35**	**4,339**	**3,669,849**	**846**	**1,984**
	1,851	1,420	1.30	3,271	2,758,309	844	1,942
60 „ 69	**2,835**	**2,266**	**1.25**	**5,101**	**5,801,455**	**1,137**	**2,560**
	1,639	1,454	1.13	3,093	3,676,352	1,188	2,528
70 „ 79	**4,308**	**3,586**	**1.20**	**7,894**	**9,247,324**	**1,171**	**2,579**
	2,117	1,837	1.15	3,954	5,805,820	1,469	3,180
80 „ 89	**2,669**	**2,149**	**1.24**	**4,818**	**6,348,237**	**1,318**	**2,954**
	1,822	1,365	1.33	3,187	5,045,662	1,583	3,696
90 and over	**337**	**169**	**1.99**	**505**	**402,654**	**796**	**2,383**
	206	127	1.62	333	474,384	1,425	3,735
Females							
Under 15	**8,191**	**7**	**11.70**	**8,198**	**2,838**	**0.350**	**405**
	5,188	6	864.6	5,194	2,718	0.523	453
15 to 20	**1,025**	**18**	**56.94**	**1,043**	**7,745**	**7.43**	**430**
	545	15	36.33	560	4,465	7.97	298
21 „ 29	**2,039**	**159**	**12.82**	**2,198**	**68,792**	**31.3**	**433**
	1,214	82	14.80	1,296	38,303	29.5	467
30 „ 39	**2,066**	**491**	**4.21**	**2,557**	**266,113**	**104**	**542**
	1,242	265	4.69	1,507	161,909	107	611
40 „ 49	**2,257**	**807**	**2.80**	**3,064**	**551,199**	**180**	**683**
	1,254	508	2.47	1,762	355,589	202	700
50 „ 59	**1,939**	**974**	**1.99**	**2,913**	**1,039,228**	**357**	**1,067**
	1,486	707	2.10	2,193	700,920	320	991
60 „ 69	**2,422**	**1,479**	**1.64**	**3,901**	**1,508,268**	**387**	**1,020**
	1,436	847	1.69	2,283	983,711	430	1,161
70 „ 79	**4,169**	**2,135**	**1.95**	**6,304**	**2,574,773**	**408**	**1,206**
	2,384	1,286	1.85	3,670	1,640,746	447	1,276
80 „ 89	**2,566**	**1,020**	**2.52**	**3,586**	**1,147,764**	**320**	**1,125**
	1,849	752	2.46	2,601	966,793	372	1,286
90 and over	**408**	**126**	**3.24**	**534**	**223,681**	**419**	**1,775**
	283	79	3.58	362	89,730	248	1,136

* The black figures apply to the totals for 1908-12, the lighter for the totals for 1913-1915.

We proceed now to consider the question of the influence of variations in the distribution of wealth according to age, and in mortality according to age, upon the devolution-rate factors α and k.

21. **Variation in the relative amounts contributed in each age-group and its consequence.**—It is now evident how profoundly the "distribution of wealth according to age" affects the results. This distribution, viz., the system of ratios for each age-group of $w/\Sigma w$, (u in the tables for Victoria, 1908-1912) is very variable from year to year, but in general shews no sign of definite progression. The uncertainty of individual results has already been estimated, and is seen in the table hereunder of values of α' and k' for Victoria, shewing how variable these factors are, notwithstanding that in the former the effect of the particular death-rate for the year, as well as total wealth disclosed in probate, has been eliminated, and in the latter the effect of the total wealth only.

Attention has already been drawn to the differences in the values of u and of ρu for Victoria in successive years. The distribution-effect is seen also in the difference of the results for New South Wales and those for Victoria. The values for α and k, *corrected* so as to give the results for infinitesimally small groups, are :—

Year.	Victoria Values of α			Victoria Values of k		
	Males.	Females.	Persons.	Males.	Females.	Persons.
1908 ..	.3341	.4292	.3276	23.06	39.02	25.76
1909 ..	.4219	.4969	.4138	32.46	49.99	36.14
1910 ..	.3580	.4174	.3542	27.95	40.96	30.83
1911 ..	.4343	.4775	.4216	34.20	46.10	36.58
1912 ..	.4099	.4204	.3954	30.60	37.98	32.31
1908-12	.3908	.4471	.3822	29.46	42.52	32.17
	New South Wales Values of α			New South Wales Values of k		
1911 ..	.4139	.2709	.3532	35.99	30.02	34.22
1912* ..	.2896	.4142	..	23.80	43.99	..
1912† ..	.2854	.4154	..	23.46	44.11	..

* Calculated from quinquennial age-groupings. † Calculated from decennial age-groupings.

The extent of the agreement between English and Australian results may be seen by calculating the relative amount contributed by each age-group after redistributing[1] the grouping of Victoria for 1908-1912, and New South Wales for 1911, so

1. This has been done by dividing into 5-year groups and re-combining, having regard at least to second differences.

as to accord with Mr. Mallet's grouping for England, 1905 and 1906.[1] Mr. Mallet had deduced the factor $k = 24.06$ from the former, and 23.78 from the latter, and regarded 24 as a satisfactory multiplier on this evidence.

Table shewing the Relative Amounts of Wealth appearing in Probate Returns according to Age for various Age-groups.

Age-Groups.	England.		Victoria.	N.S.W.	Assumed Values of R^*
	1905.	1906.	1908-1912.	1911.	
	A	B	C	D	E
Under 15	.00008	.00025	.00013	.00075	365
15 to 19	.00015	.00008	.00030	.00054	307
20 ,, 24	.00151	.00087	.00273	.00132	238
25 ,, 34	.00929	.00749	.01281	.01572	174
35 ,, 44	.03832	.02735	.04491	.04487	105
45 ,, 54	.07597	.09755	.10096	.10131	64
55 ,, 64	.17005	.16800	.16423	.17551	34
65 ,, 74	.28607	.29057	.27916	.26205	16
75 & over	.41856	.40784	.39477	.39793	7
Total	1.00000	1.00000	1.00000	1.00000	..
£1000	228,521	256,445	Av. 7,135	7,755	..
Relative result based on last column	.9468	.9363	1.0370	1.0799	Av. 1.0000

* Numbers living to one dying.

The results shew most distinctly a *general agreement*, though not a very close one. The effect of the variation can be readily computed by assuming the reciprocals of the death-rates for the group somewhat in accordance with experience. On adopting the multipliers shewn in the final column, which are approximately those of Mr. Mallet's report (*op. cit.*, p. 73), we obtain the results in the table above. These shew a range of —5.3 per cent. to +8.0 per cent., about the mean of the four results, the individual figures based on this mean being given in the bottom line of the table; or if the English results for 1906 were taken as a basis, the results for New South Wales for 1911 would be 15.3 per cent. greater. Hence, this is the order of uncertainty, even when the death rates are identical in the respective countries. In view of the general agreement between the successive age-groups, this is not a little remarkable, and it goes to confirm the view already expressed that results obtained from returns of a single year are liable to a large measure of uncertainty, and indeed that in order to obtain anything like reliable figures we should use at least five years, and preferably ten. Referring to the English results, it will be seen that there are appreciable changes in the values in Columns A and B for the different age-groups.

Before dismissing this part of the subject, it may be noted that it is probable the distribution of wealth according to age varies considerably with fluctuations that occur in the general economic condition of any community, and exist even in

1. Journal Roy. Stat. Soc., lxxvi., 1908, p. 74.

communities so near akin economically and socially as those of the States of New South Wales and Victoria. For the limited periods of time for which the necessary data are available identity of distribution is by no means characteristic. This is shewn by the table hereunder, in which are given the results for Victoria for 1908-15 (see Fig. 4, page 132), and those for New South Wales for 1911-13 and 1911-15, for comparison one with another.

The distributions are sensibly different for males and females, and are by no means identical for States—apparently similarly circumstanced—even when the means of a series of years are taken. It may be noted that, taking no account of absentees, the average wealth per estate, etc., for the periods indicated is :—

Victoria	Males, £2256.4 ;	Females, £1948.6 ;	Persons, £1825.0
New South Wales ..	,, £2419.0 ;	,, £1334.8 ;	,, £2111.6

and the average per death is :—

Victoria	Males, £694.0 ;	Females, £221.4 ;	Persons, £482.5
New South Wales ..	;, £629.2 ;	,, £199.4 ;	,, £453.8

(See Figs. 5 and 6, page 133.)

Distribution of Wealth, according to Age and Sex, as revealed in Probate Returns, Victoria, 1908-1915, and New South Wales, 1911-13 and 1911-15.

Age Last Birthday.	Victoria. Males. No. of Probate Returns.	Number Dying.	Aggregate Net Wealth, £1000.	Females. No. of Probate Returns.	Number Dying.	Aggregate Net Wealth, £1000.	Average Wealth per Estate, Victoria. Males.	Females.
							£	£
Under 15	12	16,957	3.64	13	13,392	5.56	303	427
15–20	107	1,692	26.0	33	1,633	12.2	248	370
21–29	775	3,220	388	241	3,464	107	500	444
30–39	1,335	4,005	1,023	756	4,064	428	767	566
40–49	2,714	6,444	3,090	1,315	4,826	907	1,139	689
50–59	3,270	7,610	6,428	1,681	5,106	1,740	1,965	1,035
60–69	3,720	8,193	9,478	2,326	6,184	2,492	2,548	1,071
70–79	5,423	11,848	15,053	3,421	9,974	4,216	2,776	1,232
80–89	3,514	8,005	11,394	1,772	6,187	2,115	3,242	1,193
90& over	796	839	877	205	896	313	2,963	1,529
Total All Ages	21,166	68,813	47,761	11,763	55,726	12,335	Average Wealth per Death occurring, Victoria.	
Absent's	1,624	..	3,655	720	..	909		
Ratio Values of the Above.							Males.	Females
							£	£
Under 15	.0006	.2464	.0001	.0011	.2403	.0004	0.21	0.41
15–20	.0050	.0246	.0005	.0028	.0293	.0010	15.4	7.47
21–29	.0366	.0468	.0081	.0205	.0622	.0087	120.5	30.92
30–39	.0631	.0582	.0214	.0643	.0729	.0347	255.5	105.3
40–49	.1282	.0936	.0647	.1118	.0866	.0735	479.5	187.9
50–59	.1545	.1106	.1346	.1429	.0916	.1411	844.7	340.8
60–69	.1758	.1191	.1984	.1977	.1110	.2020	1156.8	402.9
70–79	.2562	.1722	.3152	.2908	.1790	.3418	1270.6	422.7
80–89	.1660	.1163	.2386	.1507	.1110	.1714	1423.3	341.8
90& over	.0140	.0122	.0184	.0174	.0161	.0254	1045.3	349.8
Totals	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		

Distribution of Wealth, according to Age and Sex, as revealed in Probate Returns Victoria, 1908-1915, and New South Wales, 1911-13 and 1911-15.—*cont.*

Age Last Birthday.	New South Wales. Males. No. of Probate Returns.	Males. Number Dying.	Males. Aggregate Net Wealth, £1000.	Females. No. of Probate Returns.	Females. Number Dying.	Females. Aggregate Net Wealth, £1000.	Average Wealth per Estate, N. S. Wales. Males.	Females
							£	£
Under 15	21	9,208	5.94	13	7,553	6.27	283	482
	28*	**15,487**	**6.73***	**15**	**12,644**	**† *6.11**	**240***	**407***
15–20	59	780	13.56	13	625	4.60	229	352
	89	**1,323**	**25.0**	**24**	**1,017**	**10.3**	**281**	**428**
21–29	489	1,830	144	119	1,660	23.0	295	194
	775	**3,090**	**285**	**197**	**2,795**	**78.2**	**368**	**397**
30–39	748	2,155	456	296	1,802	185	610	625
	1,203	**3,707**	**984**	**478**	**3,046**	**348**	**818**	**728**
40–49	1,301	2,969	1,565	388	1,798	329	1,203	847
	2,014	**4,913**	**2,695**	**702**	**3,038**	**579**	**1,338**	**825**
50–59	1,691	3,933	3,782	586	2,030	495	1,645	844
	2,815	**6,702**	**5,224**	**1,024**	**3,452**	**902**	**1,856**	**881**
60–69	1,900	4,313	4,581	773	2,609	987	2,411	1,277
	3,141	**7,376**	**7,813**	**1,292**	**4,321**	**1,539**	**2,487**	**1,192**
70–79	2,033	4,916	6,884	836	3,083	1,246	3,386	1,490
	3,291	**10,546**	**11,927**	**1,413**	**5,276**	**1,999**	**3,624**	**1,415**
80–89	835	2,201	5,333	409	1,676	1,693	6,387	4,138
	1,447	**3,863**	**6,906**	**678**	**2,929**	**2,192**	**4,773**	**3,234**
90 & over	88	270	194	46	296	117	2,207	2,535
	143	**451**	**290**	**94**	**495**	**244**	**2,025**	**2,596**
Total All Ages	9,165	32,575	21,959	3,479	23,132	5,085	Average Wealth per Death occurring, N.S.W.	
	14,946	**57,458**	**36,155**	**5,917**	**39,613**	**7,898**		
Absentees	528	..	3,203	165	..	724		
	940‡	..	**5,298‡**	**269**	..	**1,054**		
Ratio Values of the Above.							Males.	Females
							£	£
Under 15	.0023	.2827	.0003	.0037	.3265	.0012	0.65	0.83
	.0019*	**.2695**	**.0002***	**.0025***	**.3192**	**.0008***	**0.43**	**0.48**
15–20	.0064	.0239	.0006	.0037	.0270	.0009	17.36	7.32
	.0060	**.0230**	**.0007**	**.0041**	**.0257**	**.0013**	**18.93**	**10.11**
21–29	.0534	.0562	.0066	.0342	.0718	.0045	78.85	13.90
	.0518	**.0538**	**.0079**	**.0333**	**.0706**	**.0099**	**92.26**	**27.99**
30–39	.0816	.0662	.0208	.0851	.0779	.0364	211.7	102.6
	.0805	**.0645**	**.0272**	**.0808**	**.0769**	**.0440**	**265.6**	**114.2**
40–49	.1420	.0911	.0713	.1115	.0777	.0647	527.1	182.8
	.1347	**.0855**	**.0745**	**.1186**	**.0767**	**.0733**	**548.6**	**190.6**
50–59	.1845	.1207	.1267	.1684	.0878	.0973	707.3	243.7
	.1883	**.1166**	**.1445**	**.1731**	**.0871**	**.1142**	**779.4**	**261.2**
60–69	.2073	.1324	.2085	.2222	.1128	.1942	1062.1	378.4
	.2102	**.1284**	**.2161**	**.2183**	**.1091**	**.1949**	**1059.2**	**356.3**
70–79	.2218	.1509	.3135	.2404	.1333	.2450	1400.3	404.1
	.2202	**.1835**	**.3279**	**.2388**	**.1332**	**.2531**	**1130.9**	**378.9**
80–89	.0911	.0676	.2429	.1176	.0724	.3329	2423.0	1009.9
	.0968	**.0672**	**.1910**	**.1146**	**.0739**	**.2776**	**1787.7**	**748.5**
90 & over	.0096	.0083	.0088	.0132	.0128	.0229	719.5	393.2
	.0096	**.0078**	**.0080**	**.0159**	**.0125**	**.0309**	**642.1**	**493.0**
Total	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		

* The results shewn in heavy type are for New South Wales for the years 1911 to 1915; the results in the lighter type being for 1911 to 1913. † This discrepancy is the effect of proportional distribution of the "not stated" as regards age. ‡ Including naval and military forces.

We shall now consider the causes of the irregularities referred to and the mode of eliminating their prejudicial effect.

22. **Necessity for a correction for infrequent appearance of large estates.**—Very large estates appear but infrequently in probate returns, the infrequency increasing with the size of the estate and diminishing with the size of the population. Let us consider any table shewing the number of estates of different magnitude in any territory (*e.g.*, the table from the Prussian Returns). It is manifest that if we take the devolution-period to be 22.2 years (which perhaps, however, is somewhat below the correct amount), the average frequency in Prussia of the appearance of estates of these sizes, in a probate aggregate for all age-groups, will be the number existing divided into the devolution-period. Thus, if we call this period K, and the number N, the frequency, F, is N/K, or the average interval of appearance K/N. It is obvious from this that the average frequency of appearance in a particular age-group will be considerably less. If we *assume* that it is equally likely to appear in the probate-class in any age-group, then the relative frequency in that age-group to the frequency of appearing in the aggregate of the age-groups is measured by the number of probates in the former to the number for the latter (the aggregate number).

Let the number of probate estates in any age-group be denoted by E', with a suffix to define the particular group, and the number for all groups by $E = \Sigma E'$; then this relative frequency is only the (E'/E)th part of what we found before, since the average frequency for the age-group is :—

$$(29) \ldots\ldots F' = F \,.\, E'/E.$$

Thus, if we take the number k, the multiplying factor deduced for Victoria for the period 1908-1912, multiplied by the ratio of the Prussian death-rate to the Victorian death-rate, we obtain 22.2, which may be regarded as holding approximately for Prussia. Accepting this, we should get the following results :—

Prussian Population as at 1911.

Size of Estate in millions, sterling	Over 5	1.5 to 5	.75 to 1.5	.50to .75	0.25to.50
No. of Estates	4	30	94	127	574
Years	5.5	.74	.24	.17	.04
Estates per 10 years	1.8	13.5	42.3	57.2	259

Owing to the large rate of infantile mortality for Prussia, this figure 22.2 is perhaps rather too small; but even so, it will not touch the argument, and the frequency shewn will be affected only by the ratio of 22.2 to the true value.

Detailed probate statistics for as long a period as five years are at present available in Australia for two States only, viz., Victoria and New South Wales. In the Victorian returns for 1908-12, for estates of males of over £50,000 there is only an average of 11.8 per annum, and over £100,000 only 3.2 per annum, corresponding to an aggregate number of 8488 deaths. It is evident from this that the appearance of the larger estates will be relatively rare, and since they may occur at any age, the values of ρu—see formula (11)—are subject to large variations, and consequently the values of α and of k. It is only by studying the experience of each age-group and the fluctuation in the values of ρu that we can hope to ascertain what the general trend with time is, and whether the results of a particular year for each age-group differ from the average. When for a sufficient number of years such details are to hand, the average trend can be ascertained, and appropriate corrections can be made.

Suppose, for example, a very large estate comes under review in probate returns, say once in 7 years (on the average). Then for the (average) six years in which such an estate has not appeared *the computed results will be in defect*, because the estate is in existence, though the evidence of that existence and the measure of its magnitude are not to hand. On the other hand, suppose it is included in an annual, or even in a quinquennial mean. The result will be *greatly in excess of the true annual result, and sensibly in excess of the true quinquennial result.*

A more or less definite appreciation of this consideration has, without doubt, led statisticians to regard with favour a multiplier which does not oscillate rapidly like that derived from the results of a single year. But it has ordinarily been forgotten that even when such a multiplier is used, a single year's results are of very limited value. The conclusion is that in order to improve the technique a *study* must be made when sufficient returns are to hand *of the frequency of estates of different sizes.* For this reason it is important that tabulations should be made of sizes of estates in different age-groups. From the table of values of ρu—see formula (11)—the important groups are :—less than 30 ; 30 to 49 ; 50 to 69 ; 70 and over; the extra work, however, involved in tabulating in smaller groups would not be considerable, and it would be a great advantage in studying the characteristic of wealth frequency and its variation with age. As already pointed out, there is an average annual progression in the value of ρ of a sensible amount. In the following tables the frequency for estates of various magnitudes are given, but not the distribution of this frequency according to age.

In general, however, not only are the data insufficiently complete, but also it is impracticable to apply corrections for the appearance or non-appearance of large estates ; it is preferable, therefore, to take the mean of a sufficient range of years to be able to accept the result as substantially accurate.

23. **Example of variations in the factor k and their consequences.**—The impossibility of regarding the results deduced from any one year as at all satisfactory owing to the infrequent appearance of large estates and other irregularities in the data, is well illustrated by taking the Victorian yearly data for the years 1908 to 1915.

Table shewing the Variations in the Factor k, Computed from Victorian Probate Returns, 1908-1915,‡ and New South Wales Probate Returns, 1911-1915.

Year.	Factor k Males.	Total Amount Probates £1000.	Total Wealth Males (Probates) £1,000.	Factor k Females	Total Amount Probates £1000.	Total Wealth Females (Probates) £1000.	Total Wealth Males and Females (Probates) £1000.
1908 ..	23.06	5862.7	135193.9	39.02	1265.4	49375.9	184,569
1909 ..	32.46	5115.8	166058.9	49.99	1364.6	68216.4	234,275
1910 ..	27.95	5785.0	161690.8	40.96	1646.0	67379.2	229,070
1911 ..	34.20	6776.6	231759.7	46.10	1692.5	78024.3	309,784
1912 ..	30.60	6560.7	201413.5	37.98	1972.8	74926.9	276,340
1913 ..	25.04	6730.2	168524.2	42.13	1637.7	68996.3	237,521
1914 ..	31.89	6618.0	211048.0	38.66	1863.8	72054.5	283,102
1915 ..	30.50	6959.4	212261.7	40.24	1800.3	72444.1	284,706
Total	29.517*	50408.4	1487950.7	41.638*	13243.1	551417.6	2,039,368
Average	29.463†		185994.0	41.885†		68,927	254,921
1911-15	32.26§	41453.8	1337300 ÷5=267460	44.30§	8952.1	396578 ÷5=79315	346,775

* Computed from totals. Similarly the totals give 32.040 for "persons." † Average of the factors for individual years. ‡ The factors are smaller than those in § 8, as they have been reduced in order to obtain more exact results. § The totals give 34.40 for "persons."

It may be noted also that these averages would correspond to the date 1912.0, and indicate that the uncorrected estimate for the wealth of Victoria (including the absentees) was then £254,921,000, of which 72.9613 per cent. belonged to males, and 27.0387 per cent. belonged to females.

These results for Victoria may be compared with those of New South Wales in section 21 herein. The mean of the three results are $k = 27.75$ and 39.37 for males and females respectively; but the three years 1911-13 taken together give 29.95 and 37.81 for the factors k, corrected for a continuous wealth curve. We thus have the following results, viz. :—

Victoria,	1908-1915	k = for males	29.52 ;	for females,	41.64
N.S.W.,	1911-1913	,, ,,	29.95	,, ,,	37.81
N.S.W.,	1911-1915	,, ,,	32.26*	,, ,,	44.30*

* Deduced from later figures for New South Wales for 1911 to 1915 inclusive.

the result being thus in very close agreement for males, and in fair agreement for females. If one constant is to be used for males and females combined, these must be weighted according to the aggregates of wealth. This gives (for the same periods): Victoria (persons), $k = 32.01$; N.S.W. (persons), $k = 31.43$; or N.S.W. from 1911 to 1915 (persons), $k = 34.42$; or if we combine the results for Victoria 1908-15 with those of N.S.W. 1911-1915, weighted according to the totals of the probates (including absentees), viz., for the former 64.66 millions sterling, for the latter 50.41 millions, we get for "persons" 33.07 for the two States combined, which would correspond with the epoch year 1912.7 about, and might be accepted as a value for the Commonwealth.

24. **Variation of the factor k with variation of the death-rate.**—We have seen that the factor k varies with changes in the distribution of wealth according to age, and also with relative variations of mortality according to age (u and ρ). The latter must, of course, be (imperfectly) reflected in the general death-rates. This will now be considered. For the Commonwealth and Queensland with a distribution of wealth according to age at least approximately correct, we found values, see § 11, which gave the following values for k, when corrected from 5-year groups so as to give a continuous distribution instead of groups, viz., the numbers in the first two lines below; these take the place of those on p 94.

	1886.0 (1881-1890)	1896.0 (1891-1900).	1906.0 (1901-1910).
Commonwealth k_{10} =	M 24.21 ; F 32.30 ;	M 26.14 ; F 37.56 ;	M 29.43 ; F 43.05
Queensland k_{10} =	21.70 ; 37.79 ;	24.80 ; 38.83 ;	26.85 ; 42.60
Decennial death-rate* C'wealth	.016597 ; .013703 ;	.014318 ; .011578 ;	.012453 ; .009945
Do. do. Q'land	.019551 ; .014691 ;	.014249 ; .010562 ;	.012124 ; .008829
Commonwealth a_{10} =	.4019 ; .4426 ;	.3742 ; .4348 ;	.3665 ; .4281
Queensland a_{10} =	.4243 ; .5551 ;	.3533 ; .4101 ;	.3255 ; .3761

* Expressed at per 1000 of the mean population of the year. The suffixes 10 denote that the value is a mean for a period of 10 years; and M and F denote males and females respectively.

If these values of k are multiplied by the corresponding decennial death-rates given on the third and fourth lines, the values of a shewn in the two last lines above are obtained, and these, divided by the death-rates of any year, will furnish approximately the corresponding value of the factor k, i.e, the factor for the year in question. These are as follow :—

	1886.		1896.		1906.	
Commonwealth k_1 =	M 24.26 ;	F 31.80 ;	M 26.46 ;	F 38.31 ;	M 30.52 ;	F 44.00
Ratios ..	1.000 ;	1.000 ;	1.091 ;	1.205 ;	1.258 ;	1.384
Queensland k_1 =	22.76 ;	36.76 ;	24.81 ;	38.98 ;	29.75 ;	48.47
Ratios ..	1.000 ;	1.000 ;	1.090 ;	1.060 ;	1.307 ;	1.319

The results, which, as stated, apply to the years in question only (not to the decennium as a whole), shew that while the range of uncertainty due to variation of death-rates is probably not very great, it is not negligibly small.

In order to deal with the probate results as a totality (*i.e.*, for persons), we may suppose that the ratio of wealth appearing through deaths of females bears a constant ratio to that appearing through the deaths of males. This, for the years 1908-1915 in Victoria, and 1911-1913 for New South Wales combined, gives the ratio 0.24880 to 1,* the totals being for males £76,578,929, and females £19,053,467. These ratios applied as weights to the factors k for males and females, give the following Commonwealth results for persons, viz. :—

1886, k =	25.76 ;	1896, k =	28.82 ;	1906, k =	33.21
Ratios	1.000		1.119		1.289

It would seem also that we might weight the death-rates of males and females proportionally to the total wealth, to ascertain the change of the factor k. Using the mean of the rates of the group of years in the successive decennia, we obtain the following weighted death-rates, viz. :—

Instant	1886.0	1896.0	1906.0
Weighted, combined death-rate & reciprocal	.016035 = 1/61.162	:013786 = 1/73.527	:011966 = 1/83.570

The ratio of the first reciprocal 0.061162 to the others is 1.2022 and 1.3664. If the values of k for "persons" be computed from those given for males and females in the table in § 11, we get, for the same years, viz., 1886.0, 1896.0 and 1906.0, the values 25.99, 28.60, 32.38 respectively, the ratios of the second and third to the first being 1.1000 and 1.2459. The two are only in fair agreement. The weighting of the death-rates is probably not the best course to follow.

25. **Estimate of secular variation of k for Australia.**—The reduction of the death-rate tends—other things being equal—to ensure an increase in the factor k, and as that reduction has been fairly regular, it is possible to adopt a regularly progressive value of this factor without material error. Of course, the general death-rate is largely affected by the infantile and early death-rates, which have no effect on the probates, and is therefore not quite satisfactory. But if we take the reciprocals of the death-rates from the age 20 to the end of life, and deduce the weighted results for "persons," the ratios of the second and third to the earliest result are 1.0909 and 1.1493. The growth for 10 and 20 years of the coefficient k might be regarded, therefore, as very approximately given by the following ratios, viz. :—

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* When later the 1911-15 results for New South Wales were substituted for those of 1911-13, this ratio became 0.24111 to 1.

According to Life Tables and estimated distribution	1 ;	1.100 ;	1.246
Deduced values for years 1886, 1896 and 1906	1 ;	1.119 ;	1.289
Weighted reciprocals of crude death-rates ..	1 ;	1.202 ;	1.366
Weighted reciprocals of death-rates, 20 to 105[1]	1 ;	1.091 ;	1.149
From formula (30) hereunder	1 ;	1.1046 ;	1.2219

If we suppose the factor to change uniformly, that is, if we adopt the formula

$$(30)\ldots\ldots k_t = k_0 e^{bt} = k_0 m^t = k_0\ (1.01)^t$$

as expressing it, and make $m = 1.01$, we get the results shewn in the last line above. From what has preceded we may assume that the value 33.40 for persons may be adopted for the year 1913 (average for the entire year) for Australia treated as a whole.[2] The following values are thus indicated for the Commonwealth for the successive years in the table :—

Values of k for "Persons," Australia, viz., the Multipliers for the Crude Estimation of the Indication of Wealth as given by the Probate Returns.

Year	k	Year	k	Year	k	Year	k	Year	k	Year	k
1878	23.34	1885	25.03	1892	26.83	1899	28.77	1906	30.84	1913	33.40
1879	23.58	1886	25.28	1893	27.10	1900	29.06	1907	31.15	1914	33.73
1880	23.81	1887	25.53	1894	27.37	1901	29.35	1908	31.46	1915	34.07
1881	24.05	1888	25.79	1895	27.65	1902	29.64	1909	31.78	1916	34.41
1882	24.29	1889	26.04	1896	27.92	1903	29.94	1910	32.42	1917	?
1883	24.54	1890	26.31	1897	28.20	1904	30.24	1911	32.74	1918	?
1884	24.78	1891	26.57	1898	28.48	1905	30.54	1912	33.07	1919	?

It is not to be understood that the precision is certainly as indicated by the figures as given ; these factors may possibly be in error even in the units place ; they are found by making $m = 1.01$, and k_p for 1913, 33.403.

26. **Correction for wealth of absentees.**—The New South Wales and also the Victorian returns shew that an appreciable amount of wealth belongs to "absentees," viz., to persons whose estates, and generally whose domicile, are in New South Wales or Victoria, but who die outside the State. The State records do not furnish their age at death, consequently all that is known is their numbers and the values of their estates. The following table shews the results for the years 1908-15 inclusive, and are divided according to sex and into two four-year groups. A small number of "unspecified" cases are also included, *i.e.*, cases for which the ages are not given :—

1. The actual results were :—Males, 0.01692, 0.01553; 0.01468 ; Females, 0.01316, 0.01202, 0.01154. The weights applied were : Males 1, females 0.2627, giving for the weighted rates 0.01614, 0.01480, and 0.01403 ; the reciprocals are 61.96, 67.57, and 71.28, the ratios of the second and third to the first being 1.0905 and 1.1504.

2. This would give 33.734 as the average for the year 1914. By taking the aggregate of all the probates of Victoria for 1908-1915, of New South Wales for 1911-1915, of Queensland for 1916, we obtain the following distribution for the several age-groups as before :—

Males .00012 .00059 .00804 .02429 .06956 .13863 .20752 .32274 .21420 .01431 Total 1.00000.
Females .00057 .00110 .00916 .03847 .07438 .13292 .19632 .30745 .21198 .02765 Total 1.00000.

This gives with the mean of the ratios of the living to the dying for Victoria and New South Wales for 1913-1915 the result $k_m = 30.945$; k_f 43.848 ; $k_p = 33.416$, which would coincide with the epoch 1914.0 for 1914.5, this is about 33.583, which may be compared with 33.734 above. Having regard to all the facts the latter is believed to be the more accurate value.

Ratio of Absentees to Probate Totals, excluding Absentees.*

Period.	Victoria.			N. S. Wales.		Q'land.
	1908-11.	1912-15.	1908-15.	1911-13.	1911-15.	1916.
RATIO OF NUMBERS.						
Males ..	.0832	.0709	.0769	.0598	.0629	.0969
Females ..	.0630	.0591	.0610	.0474	.0455	.1027
Persons ..	.0760	.0666	.0712	.0563	.0579	.0982
RATIO OF AMOUNTS (Net Values).						
Males ..	.0544	.0563	.0554	.1458	.1465	.2427
Females ..	.0704	.0764	.0735	.1423	.1334	.6767
Persons ..	.0576	.0605	.0592	.1452	.1442	.3075

* In these results the unspecified cases as to age are not included: they have been distributed (proportionally) among the age-groups.

The results for New South Wales differ sensibly from those of Victoria as regards "amounts," though not as regards "numbers"; while those of Queensland differ in both respects. The latter, however, cannot be regarded as normal in view of the probable influence of the war on the results, and consequently no appreciable error will probably arise if they are simply proportionally distributed among the age-groups. Having regard to the inherent limitations of ascertaining the rate of devolution, the imprecision of the distribution suggested will be relatively negligible.

If a k factor be used, the simplest method will be to merely add the absentee cases to the aggregate of the fully specified and unspecified cases before multiplying by the factor. If, however, the aggregate of wealth is deduced from the fully specified cases only, the total of which is B, and the totals for the absentees and unspecified be A and U respectively, then the correction factor c, to be multiplied into the result, will be:—

$$(31).....c = (B + U + A) / B$$

or, if the unspecified cases have been distributed, and $B' = B + U$, we have

$$(31a).....c = (B' + A) / B'$$

as the correcting factor. This is probably of the order of 1.07 or 1.08 for the entire Commonwealth.

27. **Effect of insurance policies in probate returns.**—In a country like Australia, where life assurance is relatively widespread, the inclusion of the amounts of insurance paid in probate returns has the effect of making them appear too favourable in respect of accurately representing the wealth of the balance of the population, inasmuch as the executors of deceased persons have received the full value of the policies with all bonuses, etc., while the value which can be regarded as (potentially) possessed by the balance of the population is, of course, only the full "surrender-value."[1]

1. This has been pointed out by Mr. A. M. Laughton, F.I.A., F.F.A., etc., and see Victorian Year Book, 1913-14, pp. 589-592.

The opposite is the case with regard to annuities, pensions, superannuation allowances, etc., which tend in the direction of causing an under-estimate of the amount of wealth possessed by the living. We proceed to form a quantitative estimate of these influences on the results.

From recent returns it appears that of the total claims under assurance policies paid by life assurance companies in Australia, about four-sevenths of the total is payable in respect of the *death* of the policyholder, and about three-sevenths in respect of the *maturity of policies*. For the five years 1908 to 1912, the total amount of the claims made in Australia under life assurance policies was £11,884,748, which, on the basis quoted above, would represent a payment of about £6,790,000 *in respect of death benefits*. For the five years under consideration, the amount of the assurance policies in force in Victoria represented about 32 per cent. of the total for Australia, and consequently the payment for death benefits in Victoria in respect of life assurance policies was approximately 0.32 × £6,790,000, or about £2,170,000 in the aggregate for the five years 1908 to 1912, or say, on the average £434,000, in a year.

Similarly, for the same period, the amount paid as annuities by life assurance companies in Victoria was approximately £25,000 per annum.

From the returns of one of the largest of the Australian companies, it appears that, as at 31st December, 1913, the appropriate reserve value of sums assured and bonuses aggregating to £96,750,000 was £29,300,000, or about 30% of the face value of the policies, while, in the case of life annuities of £79,000 per annum, the capitalised value was £665,000, or on the average about 8.4 years' purchase. It would thus appear that for the 5 years 1908 to 1912, the exclusion in the case of Victoria of consideration of the special features of life assurance and annuity policies would have the effect of *overstating* the wealth of that State by k times 70 per cent.[2] of £434,000, or about £300,000 $\times k$, in respect of assurance, and of understating it by the absolute amount of £25,000 multiplied by 8.4, viz., £210,000 in respect of annuities. The quantity k denotes the appropriate multiplier used for converting amount subject to probate into total wealth. With a multiplier of say 32,[3] the net result would be an overstatement of about £9,400,000 in the estimate of the total wealth of Victoria. A correction for this would reduce the estimate to about 96 per cent. of the uncorrected total wealth.[4] Consequently, in order to allow for the overestimate due to the falling-in of life policies at death, the results for the Australian States should be multiplied by about 0.96.

28. **Ratio of net to gross values of estates in probate returns.**—In certain cases the only available data are the gross values of the estates appearing in probate returns. Where this is the case, it is clearly necessary to deduce the latter from the former in order to ascertain the total private wealth. Unfortunately, however, complete information does not exist as to the relation between the two values, inasmuch as available information connecting these extends back only a few years. The circumstances are different in each State: each will therefore be referred to in turn.

Victoria.—The returns for 1908-15 give the ratios in the table hereunder, in which the available results for New South Wales, South and Western Australia, and Queensland are also given for comparison.

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2. That is 100% − 30%, *vide supra*. 3. The result for 1908-12 for Victoria is about 32.64.
4. If we take £233,000,000 as the average total wealth for the period considered, the result is 0.9596.

Ratio of Net to Gross Values of Estates.

State.	Victoria.								S.A.	W.A.	N.S.W	Q'ld.
Year ..	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1912.	1912.	1902-11.	1916.
Males ..	.8425	.8194	.8626	.8624	.8663	.8669	.8771	.8645	?	?	?	.6754
Females	.8878	.8734	.9200	.8988	.9175	.8900	.9085	.9191	?	?	?	.8504
Persons	.8502	.8302	.8747	.8694	.8776	.8713	.8838	.8751	.8353	.7258	.8907	.7031

This ratio or factor of reduction is, however, not uniformly distributed in regard to age, as one might naturally expect, and differs for males and females. It has consequently been taken out in sex and age-groups, the results being as follows :—

Ratio of Net to Gross Value of Estates according to Age-groups, Males and Females, Victoria, 1908-12.

Years.	Ages.								90	Ab-
1908-12.	10–14.	15–20	21–29	30–39	40–49	50–59	60–69	70–79	80–89	and over	sentees.
Males	1.0000	.8840	.7877	.6858	.7505	.8079	.8171	.8687	.9236	.9158	.9382
Females	.9702	.8712	.8730	.8276	.8521	.8888	.8784	.9132	.9326	.9229	.9624
Persons	.9823	.8802	.8071	.7268	.7700	.8245	.8290	.8781	.9249	.9183	.9438

The ratio of the net to gross values appears for every age to be characteristically different for males and females. A curve drawn through the group-values for each sex indicates that the encumbrance on estates increases in each to the age of about 35 or 36, and then diminishes, the ratio of net to gross values being about 0.67 in the case of males, and about 0.815 in the case of females. This dissimilarity is confirmed when the results are taken out for all ages in one group, the result for Victoria for the period 1908-1912 being as follows :—

Including absentees	Males	.85176	Females	.90139	Persons	.86167
Excluding ,,	,,	.84658	,,	.89715	,,	.85673

Except that there is less encumbrance on the estates of females, the two continuous curves, which are indicated by the group-values in the preceding table, are very similar. (See Fig. 7, page 133.)

The facts shew that males and females cannot be regarded as a homogeneous group, and consequently probate results should not be grouped together for "persons," but kept separately for males and females ; the grouping of them together tends to increase the measure of uncertainty when deductions are made of the total private wealth either from net or from gross value.

New South Wales.—The relation of gross and net values for New South Wales depends upon returns for the decade 1902-1911. Mr. J. B. Trivett, Statistician of that State, gives the results, shewn later, from Probate Court and Stamp Duty returns ; see Official Year Book, New South Wales, 1912, p. 257. The gross value irrespective of encumbrances, was shewn in his report, also the net value of the estates, since it is upon these that the duty is paid. The two returns have not been co-ordinated year by year, however, and the numbers are not in exact agreement, inasmuch as Probate Court returns refer to the year ending 31st December, and the Stamp Duty returns to the year ending 30th June.

This involves some difficulty in ensuring a satisfactory determination of the ratio in question. However, the average ratios for the periods 1902-5, 1906-8, 1909-11[1], are 0.8322, 0.8669, and 0.9526 respectively, while the ratio for the whole period 1902-11 is 0.8907, though the mean of the three ratios is only 0.8839. The results indicate that for New South Wales there is probably an increase of about 0.018 *per annum* on a mean of about 0.884, and for Victoria about 0.017 on about

1. Obtained by dividing the total values, gross or net, by the number of estates, and ascertaining the ratio of the quotients.

0.840; in other words, the rate of the improvement for Victoria is about 60% of that of New South Wales. Such results cannot, of course, be extrapolated in order to discover the relationship between net and gross values for earlier periods.

South Australia and Western Australia.—The only results available for the States of South and Western Australia are those for 1912, the results being :—for the former, 1391 estates, the gross and net values of which were respectively £2,408,732 and £2,011,589; for the latter, 864 estates, the gross and net values being £841,800 and £605,622. These give the ratios 0.83528 and 0.72575.

For the State of *Queensland* there are no available data shewing the relationship of gross and net values before 1916. For that year the data give the result shewn in the preceding table (earlier part of this section).

For the State of Tasmania there are no available data.

The Commonwealth.—By weighting the preceding results we obtain a factor for the Commonwealth, viz., 0.8620, which may be applied throughout if we assume that this relation is constant. Such assumption is, of course, a precarious one, for it is quite possible that the indication of the results for New South Wales for the past ten years and those for Victoria apply generally.

29. **Effect of re-grants and re-seals.**—In estimating wealth from probates, it is necessary to take account —*inter alia*—of the amounts appearing in what are known as re-grants and re-seals. The former denote second probates granted, for example, where the values of the estate are found to be quite different from what initially appeared to be the case : the latter denote actions taken by the probate authorities of a State (other than that in which the possessor of the wealth was domiciled) for the portion of the estate within the territory over which they have jurisdiction.

The aggregates of the numbers for a combination of States are obviously in excess of the number dying; the aggregates of the wealth, however, contain no such duplication, but the k factor to be applied would probably be that of the State in which they initially arise, not the State to which they are referred. In view of the great measure of uncertainty in the "multiplier," however, it will suffice to add their values to the probate-totals.

30. **Corrections for wealth passing by settlements.**—In Chap. I., § 1, of this part, p. 68, it is mentioned that de Foville has shewn that account must be taken of settlements, which are virtually anticipations of inheritance, and also that Gini has established that, in Italy, the interval between successive settlements was sensibly equal to the interval between successions.

It is obvious that when wealth is conveyed by gift during a lifetime, the act of conveyance operates to reduce the amount which otherwise would have appeared later in the probate returns of the donors, and it increases the wealth of the donees, who in general are of a younger age. It thus *unduly diminishes the estimate of wealth.* It differentiates, according to age, the living from the dying, by enriching the former at the expense of the latter. Hence, from this point of view, it is evident that if *all* settlements were made just before death, the fundamental assumption, that the dying are a fair sample of the living, requires that the deduced amount of aggregate wealth in any age-group shall be corrected by adding the amount of the settlements at the age of the donors to the amount appearing in the probates : that is to say, the amount $R_x s_x$ must be added to the deduced total wealth of those of age x, by way of correction (R_x denoting the reciprocal of the death-rate for the age in question, and s_x the amount of the settlements by persons of that age).

Retaining the same supposition, if, also, the whole of the settlements were throughout proportional to the probate amounts, the general factor k could be applied to their sum to find the correction to the aggregate of wealth computed, without taking them individually into account, that is, as distributed according to age. If they were not substantially proportional, then the correction would be their aggregate, *i.e.*, $\Sigma(R_x s_x)$. This would indicate that the correction for settlements would be of the order $k\Sigma s$, or if S represents the aggregate of the settlements kS.

Again, if *all* the donees, assumed to be the younger, died immediately after receiving a settlement, the inclusion in their probates would have the effect of *unduly increasing the estimate of wealth*. For if they were a years younger than the donor of age x, they would appear in the aggregate result as $R_{x-a} s_x$, whereas, in the case of the donor dying, they would have appeared as $R_x s_x$, a much smaller amount, because from age 12 onwards, the factors R decrease, and with growing rapidity as age advances. It would thus appear that a correction of the amount $\Sigma(R_{x-a} s_x)$ must always be an excessive one. The correction $\Sigma(R_x s_x)$ can hardly be an excessive one, and probably would generally be in defect. Of course, in respect both of donors and donees it is obvious that the number of settlements will not coincide, case for case, with the number of deaths. For this reason it may be necessary to have regard to the effect, not only of the settlements in any current year, but of past settlements also, in disturbing the fundamental assumption on which the whole devolution-rate depends, viz., that the dying and living at any age are identically characterised as regards wealth. In the absence of complete data, however, a rigorous solution is not worth attempting, and would be of little value; it may be assumed that the error of adding the aggregate of the settlements to the aggregate of the probates will be negligible.

Settlements are of two classes, (i.) those that come under notice and are duly recorded (registered settlements); (ii.) those which take place privately (*a*) by way of evading probate duties, (*b*) are informal *gifts* of value (*i.e.*, are transfers of wealth without consideration); or (*c*) are formal gifts from "natural love and affection," etc. Of the recorded ones some will later fall into the probates through the death of the donees, and the question arises how far a deduction should be made from the aggregate amount of the probates by way of correction. This inquiry fails, however, for want of data.

The registered settlements of New South Wales and of Victoria (the latter probably coming into cognisance through the insolvency proceedings) are as follows:

Year	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.
N.S.Wales (£1000)	99.4	104.9	74.1	104.9	168.6	136.7	514.9	251.8
Victoria (£1000)	225.5	74.9	315.8	184.3	126.8	—	—	—

It is evident from the amounts that they are only a very small part of the actual settlements, as the results hereunder shew.

In *Victoria* the duties collected on registered settlements ranged from $\frac{1}{2}\%$ to $2\frac{1}{2}\%$ in the years mentioned below, and were as follows:—

1910.	1911.	1912.	1913.	1914.	1910-15.
£11,349	£16,875	£14,943	£17,096	£14,635	£14,980 (average)

For the purpose of ascertaining approximately what sums are represented by these amounts of duty, a special compilation was undertaken of the major portion of the 1914 settlements, with the following results:—

Subject ..	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Whole Year
Amount ..	£479,094	£376,041	£320,499	£393,996	£1,569,630
Duty paid ..	£4,658	£2,935	£2,430	£3,605	£13,628
Percentage ..	0.97%	0.78%	0.76%	0.92%	0.87%

The amount was 115.2 times the duty paid, which gives about £1,725,700 as an annual average of the settlements. Since the annual average net wealth appearing in the probate returns was £8,256,640 (including absentees), this sum represents no less than 20.91% of the total, and cannot therefore be neglected. On the whole, it is thought that to incorporate the entire amount with the probate-aggregates as suggested, will not cause an overestimate of the wealth, indeed, in view of the fact that a large number of settlements do not come under observation at all (*e.g.*, marriage settlements which are often considerable), it is possible that the error is one of considerable defect.[1] We may therefore take 20.9 per cent. as the necessary correction, and therefore 1.209 as the correction-factor for the effect of settlements, *i.e.*, in Victoria, and in the absence of definite information for the rest of Australia.

31. **The distribution of wealth among the dying, Victoria.**—Victoria is the only State in the Australian Commonwealth which has compiled returns shewing for each year of age number of probates, and the net values of the States represented. These afford the necessary indication of the variableness of the numbers and values for different ages, and thus they reveal one of the essential limitations of the probate method of estimating wealth, unless the returns are spread over a considerable number of years or apply to a very large population. In the following table the number of deaths is given for each age, also the number of probates and the aggregate of their net values. The smoothed values of these are also given: the net values per probate are deduced from the smoothed results, and these values are again given. The ratio of probates to deaths are also given for each age.

The numbers for each age and sex for the years 1908-1915 inclusive, are given on Fig. 8, see p. 134, the zigzag lines denoting the successive triennial age-means, and the curves giving the smoothed results for the same total.[2]

The aggregate values of the probate estates for each age and sex are shewn by Fig. 9, see p. 134, the zigzag lines denoting in this case the quinquennial age-means. The curves are the smoothed results with the same totals.[3]

Fig. 10, see p. 135, shews the average wealth per probate for each age and sex on Curves A and B, the dots and crosses denoting respectively the results as given by the smoothed values for males and females respectively. The circles and squares are the quinquennial age-means of quotients obtained from the numbers and values of probates for three consecutive ages, attributed to the middle age. The law of increase with age in the average value of probates is thus seen not to be very definite.

Curves C and D, on Fig. 10, shew for males and females respectively the ratio of probates to deaths according to age. The dots shew the values deduced for the smoothed results. The smoothed results, agreeing therewith, are denoted by the continuous curves: the general indication of these are shewn by the more regular broken curves, marked C′ and D′.

In the following table the data are given on which each of the curves referred to is based, as also the smoothed results obtained therefrom :—

1. The essence of the question is as follows :—Consider a population perfectly homogeneous in respect to the dying and living as regards the distribution of wealth according to age—a population in which no settlements have taken place. When, in such a population, a person of any given age makes a settlement on another (of the same or some other age) the effect is to disturb the pre-existing homogeneity. When the donor dies his estate will be in defect, while the estate of the donee, if living, will be in excess. Hence, when the donor's estate is multiplied by the ratio of the living to the dying, it would not even represent (if the donee were of the same age) the wealth of the living irrespective of the increase due to the settlement.

This point of view takes no account, however, of the rate of growth of wealth from the point of time at which the settlement was made, or of the possible fact that the rate of growth may itself possibly be an ascertainable function of age, and may not be a question merely of accumulation according to the general rate of interest. In fact, there is reason to believe that the rate of increase of wealth is appreciably greater for the period 48 to 55 years of age (for males) than for any other period.

2. The ordinates to the curves at the middle of the year-ranges give the number for the particular year of age in question.

3. The results for individual years of age are so irregular that it was preferable to take the mean of 5 consecutive years of age and attribute them to the middle year of age.

Distribution of Wealth among the Dying, according to Probate-Returns, Victoria, 1908-1915. 68,813 Deaths of Males.

Age last Birth-day.	Males. Crude Data.			Males. Smoothed Results.			Net Values per Probate.		Ratio Probates to Deaths from Smooth'd Results.
	No. of Deaths.	No. of Pro-bates.	Net Values.	No. of Deaths.	No. of Pro-bates.	Net Values.	From Sm'th-ed Results.	Again Sm'th-ed.	
			£1,000			£1,000	£	£	
0	11,447	3	1.1	11,447	0.1	0.1	..	300	.000
1	1,900	0	0.0	1,900	0.2	0.1	..	301	.000
2	665	0	0.0	665	0.3	0.2	..	302	.000
3	465	2	1.0	465	0.4	0.2	..	303	.001
4	339	0	0.0	339	0.5	0.3	..	304	.002
5	301	0	0.0	309	0.6	0.3	..	305	.002
6	287	0	0.0	272	0.7	0.4	..	306	.003
7	236	0	0.0	240	0.8	0.4	..	307	.003
8	196	1	0.6	215	0.9	0.5	..	308	.004
9	206	0	0.0	195	1.0	0.5	..	309	.005
10	192	0	0.0	183	1.1	0.6	..	310	.006
11	174	1	0.1	176	1.3	0.6	..	312	.007
12	176	0	0.0	177	1.7	0.7	..	315	.010
13	170	3	0.5	182	2.4	0.8	..	319	.013
14	199	2	0.2	194	3.6	0.9	..	324	.018
15	203	8	0.7	214	5.3	1.2	226	330	.025
16	241	9	1.2	243	8.1	1.8	222	337	.033
17	275	12	3.4	277	12	2.7	225	345	.043
18	308	16	3.1	313	18	5.0	278	354	.058
19	361	27	4.8	335	27	9.9	367	364	.081
20	337	35	12.8	348	37	16.2	438	375	.106
21	340	54	25.7	353	53	24.4	460	387	.150
22	381	87	35.4	357	75	31.5	420	400	.210
23	351	83	36.6	361	84	36.5	435	415	.233
24	335	86	29.6	363	89	42.6	479	433	.245
25	376	88	49.8	363	93	46.7	502	451	.256
26	375	101	33.1	361	94	50.7	539	478	.260
27	349	97	74.8	357	95	54.8	577	511	.266
28	347	81	33.9	353	96	57.8	602	551	.272
29	332	98	59.2	347	97	60.9	628	599	.279
30	373	102	71.3	346	99	64.9	656	647	.286
31	321	94	52.0	348	103	70.0	680	687	.296
32	382	113	71.0	354	107	76.1	711	720	.302
33	359	118	145.1	365	114	85.2	747	747	.312
34	350	107	62.2	378	123	95.4	776	769	.325
35	436	141	120.8	393	134	106.6	795	791	.341
36	415	137	116.8	413	145	118.7	819	812	.351
37	440	177	164.5	433	156	131.9	846	838	.360
38	491	183	110.7	456	168	148.2	882	870	.368
39	437	153	109.0	480	182	166.4	914	909	.379
40	478	222	167.5	505	197	186.7	948	953	.390
41	447	204	264.0	534	212	209.1	986	993	.397
42	609	244	245.5	563	228	233.4	1,024	1,033	.405
43	597	242	189.4	595	245	260.8	1,064	1,073	.412
44	566	232	249.9	629	263	292.3	1,111	1,113	.418
45	742	275	510.7	660	284	327.8	1,154	1,155	.430
46	693	285	337.0	693	303	364.3	1,202	1,212	.437
47	687	332	342.2	727	318	401.9	1,264	1,270	.437
48	765	345	357.8	754	329	439.4	1,336	1,335	.436
49	759	332	424.8	770	333	476.0	1,429	1,431	.432
50	886	346	427.1	783	335	511.5	1,527	1,529	.428
51	655	301	747.5	790	334	545.0	1,632	1,625	.423
52	829	361	752.0	795	332	574.4	1,730	1,721	.418
53	738	324	470.6	795	330	600.8	1,820	1,816	.415
54	856	330	452.2	793	327	625.2	1,912	1,911	.412
55	718	313	652.3	783	324	649.8	2,006	2,006	.414

Distribution of Wealth among the Dying, according to Probate-Returns, Victoria, 1908-1915. 68,813 Deaths of Males.—*cont.*

Age last Birth-day.	Males. Crude Data.			Males. Smoothed Results.			Net Values per Probate.		Ratio Probates to Deaths from Smooth'd Results.
	No. of Deaths.	No. of Pro-bates.	Net Values.	No. of Deaths.	No. of Pro-bates.	Net Values.	From Sm'th-ed Results.	Again Sm'th-ed.	
			£1,000			£1,000	£	£	
55	718	313	652.3	783	324	649.8	2,006	2,006	.414
56	753	316	412.7	769	318	671.8	2,113	2,113	.414
57	738	314	999.9	753	313	691.1	2,208	2,208	.415
58	757	365	860.8	734	311	709.4	2,281	2,283	.424
59	678	299	652.0	710	311	727.7	2,340	2,340	.438
60	859	315	553.5	694	314	748.0	2,382	2,389	.452
61	556	227	604.1	697	318	772.3	2,429	2,438	.456
62	698	305	1070.4	715	325	805.8	2,479	2,487	.455
63	764	335	738.5	740	333	847.3	2,544	2,538	.450
64	758	350	984.0	780	346	895.0	2,587	2,590	.444
65	1,013	424	979.4	827	359	952.8	2,654	2,654	.434
66	803	353	955.5	866	373	1022.9	2,742	2,742	.431
67	839	387	800.0	903	388	1106.1	2,851	2,851	.429
68	1,006	431	1072.3	943	405	1217.9	3,007	3,007	.429
69	895	452	1717.8	982	426	1313.1	3,082	3,082	.434
70	1,214	511	1679.2	1,019	446	1390.3	3,117	3,117	.438
71	910	439	1331.3	1,056	468	1451.3	3,101	3,101	.443
72	1,073	497	1326.4	1,093	493	1501.9	3,046	3,046	.451
73	1,115	509	1378.2	1,131	521	1546.6	2,969	2,969	.461
74	1,150	514	1548.1	1,167	551	1581.1	2,870	2,870	.472
75	1,349	607	1612.2	1,204	580	1609.0	2,775	2,775	.482
76	1,226	557	1590.2	1,241	599	1633.9	2,728	2,728	.483
77	1,151	573	1643.7	1,277	612	1654.1	2,702	2,702	.479
78	1,443	654	1485.6	1,297	616	1668.3	2,708	2,708	.475
79	1,214	560	1456.0	1,291	604	1672.4	2,769	2,769	.468
80	1,393	643	2644.9	1,244	577	1655.1	2,869	2,850	.464
81	1,000	466	1150.5	1,177	532	1572.9	2,957	2,930	.452
82	1,084	485	1515.4	1,097	483	1451.2	3,005	3,020	.440
83	971	427	1004.2	1,000	424	1329.4	3,136	3,120	.424
84	968	424	1437.2	898	367	1197.4	3,262	3,220	.409
85	734	294	779.6	775	315	1055.4	3,350	3,320	.407
86	647	292	1012.0	626	264	903.1	3,420	3,410	422
87	484	209	902.5	504	209	740.8	3,545	3,490	.415
88	400	154	512.5	404	159	578.5	3,638	3,540	.394
89	322	119	433.8	315	125	426.2	3,410	3,580	.397
90	244	83	211.4	243	95	284.2	2,992	3,620	.391
91	148	58	143.8	183	69	203.0	2,942	3,650	.377
92	124	47	104.7	136	48.0	152.2	3,171	3,670	.353
93	96	32	706.8	98	32.0	114.7	3,584	3,670	.327
94	64	24	240.9	69	21.3	89.3	4,192	3,660	.309
95	47	16	45.8	40.3	14.2	68.0	4,789	3,650	.352
96	41	10	21.4	27.3	9.5	50.7	5,337	3,640	.348
97	22	7	4.6	18.2	6.3	36.5	5,793	3,620	.346
98	19	12	2.6	11.7	4.2	24.4	5,809	3,580	.358
99	10	2	0.8	7.0	2.8	14.2	5,070	3,530	.400
100	9	2	5.4	4.3	1.9	6.1	3,211	3,470	.442
101	7	1	0.1	2.9	1.3	4.0	..	3,420	..
102	2	..	..	1.8	0.9	2.4	..	3,350	..
103	0	..	..	1.1	0.6	1.0	..	3,250	..
104	1	..	..	0.7	0.4	0.4	..	..	..
105	0	..	..	0.3	0.3	0.3	..	..	..
106	0	..	..	0.2	0.2	0.2	..	..	..
107	3	2	1.0	0.1	0.1	0.2	..	..	..
108	1	..	..	0.1	..	0.1	..	..	..
109	0	..	..	..	..	0.1	..	..	..
110 & over	1	..	..	..	..	0.1	..	..	..
Unspec.	16	7	8.1	..	..	..	..	..	..
Totals	68,813	21,017	48363.3	68,813	21,017	48363.3	..	..	..

Distribution of Wealth among the Dying, according to Probate-Returns, Victoria, 1908-1915. 55,726 Deaths of Females.—*cont.*

Age last Birth-day.	Females. Crude Data.			Females. Smoothed Results.			Net Values per Probate.		Ratio Probates to Deaths from Smooth'd Results.
	No. of Deaths.	No. of Pro-bates.	Net Values.	No. of Deaths.	No. of Pro-bates.	Net Values.	From smooth-ed Results.	Again smooth-ed.	
			£1,000			£1,000	£	£	
0	8,612	1	.2	8,612	0.1	0.1	..	400	000
1	1,539	0	0.0	1,539	0.1	0.1	..	401	.000
2	553	0	0.0	553	0.2	0.1	..	402	.000
3	417	0	0.0	417	0.3	0.2	..	403	.001
4	322	0	0.0	333	0.4	0.2	..	404	.001
5	288	0	0.0	286	0.5	0.2	..	405	.002
6	250	1	0.2	249	0.6	0.3	..	406	.002
7	226	1	0.1	220	0.7	0.3	..	407	.003
8	199	1	2.1	198	0.8	0.4	..	408	.004
9	167	0	0.0	180	0.9	0.5	..	409	.005
10	159	3	1.0	163	1.0	0.6	..	410	.006
11	150	0	0.0	153	1.1	0.7	..	412	.007
12	154	0	0.0	155	1.3	0.8	..	414	.008
13	167	2	1.2	169	1.7	0.9	..	416	.010
14	188	4	0.8	187	2.3	1.0	..	418	.012
15	211	3	0.6	208	3.2	1.1	344	420	·015
16	240	3	0.7	233	4.0	1.2	300	423	.017
17	262	6	3.0	262	5.2	1.5	288	426	.020
18	296	5	1.4	292	6.6	2.1	318	429	.023
19	320	6	1.7	317	8.1	2.7	333	433	.026
20	318	10	4.8	337	10.0	3.7	370	437	.030
21	335	12	2.3	354	12.2	5.0	410	442	.035
22	399	21	8.7	370	1.48	6.4	433	447	.040
23	411	15	7.4	382	18.0	8.0	444	453	.047
24	363	20	11.6	388	21.5	9.8	456	462	.055
25	353	19	4.2	392	25.1	11.7	466	471	.064
26	390	33	19.7	393	29.5	13.8	468	480	.075
27	387	40	16.2	392	34.0	16.0	471	489	.087
28	442	39	20.8	389	38.5	18.3	475	497	.099
29	370	42	16.2	386	43.1	22.7	527	504	.112
30	404	51	16.3	382	48.2	25.5	529	510	.126
31	357	49	11.2	375	54	28.4	526	515	.144
32	390	52	41.3	373	59	31.4	532	520	.158
33	345	55	14.1	378	64	34.5	539	525	.169
34	399	79	67.2	384	69	37.8	548	531	.180
35	413	81	51.7	394	75	41.4	552	538	.190
36	458	85	53.4	407	81	45.4	560	548	.199
37	372	79	38.5	416	87	49.9	574	561	.209
38	489	116	82.5	422	94	55.0	585	577	.223
39	437	109	48.8	426	101	60.8	602	597	.237
40	479	116	66.9	430	108	67.4	624	625	.251
41	338	79	50.8	436	115	75.9	660	655	.264
42	521	136	97.2	445	121	82.9	685	675	.272
43	420	118	60.4	458	127	89.6	706	700	.277
44	458	132	92.1	478	133	96.0	721	720	.278
45	555	145	110.4	507	137	102.4	747	740	.270
46	468	117	147.0	530	141	108.8	772	762	.266
47	503	162	89.0	543	145	115.2	795	786	.267
48	528	145	79.2	548	149	121.6	816	812	.272
49	556	165	113.7	547	153	128.0	837	838	.280
50	573	162	159.1	541	157	134.4	856	862	.290
51	439	125	111.5	534	160	140.8	880	885	.300
52	557	190	171.9	523	163	147.2	903	908	.312
53	504	162	174.0	511	165	153.6	931	930	.323
54	535	172	134.0	503	167	160.0	958	951	.332
55	470	145	140.8	496	169	166.4	985	970	.341

Distribution of Wealth among the Dying, according to Probate-Returns, Victoria, 1908-1915. 55,726 Deaths of Females.—*cont.*

Age last Birthday.	Females. Crude Data.			Females. Smoothed Results.			Net Values per Probate.		Ratio Probates to Deaths from Smooth'd Results.
	No. of Deaths.	No. of Probates.	Net Values.	No. of Deaths.	No. of Probates.	Net Values.	From smoothed Results.	Again smoothed.	
			£1,000			£1,000	£	£	
55	470	145	140.8	496	169	166.4	985	970	.341
56	522	191	252.3	491	171	172.8	1,010	990	.348
57	503	178	274.8	489	174	179.2	1,030	1,010	.356
58	496	176	150.4	486	177	185.6	1,048	1,028	.364
59	507	180	171.3	486	181	192.0	1,061	1,044	.372
60	543	191	175.2	492	185	199.5	1,078	1,058	.376
61	390	168	176.2	505	190	208.1	1,095	1,073	.376
62	557	210	258.7	525	196	217.3	1,109	1,089	.373
63	583	207	200.7	552	204	227.6	1,116	1,105	.370
64	552	214	171.3	587	214	239.0	1,117	1,121	.365
65	710	255	355.6	633	226	253.0	1,120	1,137	.357
66	593	220	247.6	676	241	272.0	1,129	1,153	.357
67	708	275	309.9	717	258	292.0	1,132	1,168	.360
68	810	301	270.2	746	277	316.0	1,141	1,182	.371
69	738	284	326.4	787	297	324.0	1,091	1,195	.377
70	984	355	355.3	818	317	370.0	1,167	1,207	.387
71	720	272	539.4	858	336	400.0	1,191	1,218	.392
72	912	327	297.1	945	351	428.1	1,220	1,228	.371
73	969	355	394.1	1,034	364	446.1	1,226	1,244	.352
74	1,078	351	541.3	1,090	369	452.1	1,225	1,244	.339
75	1,149	426	467.0	1,113	370	450.1	1,217	1,252	.332
76	1,143	360	360.5	1,101	365	440.1	1,206	1,259	.331
77	993	327	467.2	1,070	351	428.1	1,220	1,221	.328
78	1,101	349	395.7	1,031	332	406.1	1,223	1,217	.322
79	924	297	397.2	980	311	380.0	1,222	1,215	.317
80	1,034	312	349.8	924	289	347.0	1,201	1,180	.312
81	705	218	267.7	859	265	315.0	1,189	1,170	.308
82	834	247	279.9	790	238	284.0	1,193	1,170	.301
83	735	216	239.0	726	211	254.0	1,204	1,180	.291
84	750	213	262.1	662	185	224.0	1,211	1,200	.280
85	573	166	235.4	591	160	196.0	1,225	1,220	.271
86	527	135	162.4	513	136	169.0	1,243	1,240	.265
87	404	100	115.7	428	112	143.0	1,277	1,270	.262
88	371	100	115.2	355	91	119.0	1,308	1,300	.256
89	254	65	87.4	287	73	97.0	1,329	1,330	.254
90	251	66	101.7	225	57	77.0	1,351	1,350	.253
91	152	36	44.8	175	44	59.0	1,341	1,330	.251
92	119	35	72.2	127	34	45.0	1,324	1,300	.268
93	103	15	20.9	97	25	33.0	1,320	1,260	.258
94	76	15	9.4	74	17	23.0	1,353	1,230	.230
95	52	16	23.5	56	13.5	15.0	1,111	1,140	.241
96	46	10	19.4	41	9.5	8.0	842	1,030	.232
97	27	3	18.3	30	6.3	5.0	793	910	.210
98	27	4	6	21	4.2	3.0	714	780	.200
99	16	1	0.2	14	2.8	2.0	714	640	.200
100	13	2	2.3	8.5	1.9	1.2	632	490	.223
101	3	..	0.0	5.5	1.3	0.7	..	320	..
102	4	2	0.6	3.3	0.9	0.4	..	..	..
103	2	..	0.0	2.0	0.6	0.3	..	..	..
104	0	..	0.0	1.2	0.4	0.2	..	..	..
105	2	1	0.4	.9	0.3	0.1	..	..	..
106	1	..	0.0	.6	0.2	0.1	..	..	..
107	1	..	0.0	.4	0.1	0.1	..	..	..
108	0	..	0.0	.3	..	0.1	..	..	..
109	0	..	0.0	.2	..	0.1	..	..	..
110 & over	1	..	0.0	.1	..	0.1	..	..	..
Unspec.	2	3	1.0	..	..	..	..	..	..
Totals	55,726	11,764	12330.9	55,726	11764.0	12330.9	..	..	..

32. **Distribution according to age probably not constant.**—In order to obtain the values in the table of § 25, a constant relative distribution of aggregate wealth according to age-groups was assumed. Such constancy is, however, improbable. We may now consider the question further. If the ratio of the number of probates to the total number of persons dying in a given age-group be constant from year to year, and the death-rate in that age-group be also constant, it will follow as a consequence that the *numbers* of probates will vary from year to year as the numbers living in the given age-group of the population, and if at every date the average wealth for that group be relatively the same (*i.e.*, similarly related but not necessarily identical in amount) the *aggregate amounts* of the probates in that age-group will vary as the numbers; in short, the wealth in any age-group will vary with the population in that group. Thus, if we have the absolute or relative constitution according to age of the population at two dates, *i.e.*, if we have for each date, either

$$(32)\ldots\ldots \mathrm{P} = P_1 + P_2 + \text{etc., or } 1 = p_1 + p_2 + \text{etc.},$$

we can deduce for one date the probate distribution of the relative amount of the probates from the given distribution at the other date. As in Chapter II. of this part, let u_x denote $w_x/\Sigma w$, and in (32) above let accented quantities denote values at any particular date, which are to be referred to a date for which the distribution is known, then, subject to the assumption referred to holding good, we have :—

$$(33)\ldots\ldots u'_n = g u_n p'_n / p_n = h u_n P'_n / P_n$$

the constants g and h being so taken that $\Sigma u' = 1$.[1] Thus a probable distribution scheme (series of values of u') can be deduced, based upon known age-distributions of the population. Similarly, it could be based upon the ratio of the number of deaths occurring in the various age-groups.

33. **Correction for variations in the age-distribution.**—From the several censuses the ratios of the relative distributions of population according to age[2] are as shewn in the following table. It will be noticed that the variations are very irregular.

Ratios of Relative Populations.

Age-group	Males.				Females.			
	1881.	1891.	1901.	1911.	1881.	1891.	1901.	1911.
0–9	1.173	1.154	1.060	1.	1.284	1.243	1.085	1.
10–14	1.193	1.068	1.188	1.	1.295	1.139	1.210	1.
15–20	1.025	.921	.963	1.	1.115	1.006	1.010	1.
21–29	.920	1.110	.905	1.	.901	1.064	.975	1.
30–39	.893	1.032	1.106	1.	.795	.880	1.009	1.
40–49	.926	.740	.909	1.	.809	.689	.832	1.
50–59	.946	.844	.773	1.	.782	.835	.780	1.
60–69	.868	.996	1.089	1.	.668	.825	1.022	1.
70–79	.585	.652	.922	1.	.462	.542	.773	1.
80–89	.500	.579	.768	1.	.345	.493	.744	1.
90 & over	.455	.818	.757	1.	.425	.450	.600	1.
All Ages	1.	1.	1.	1.	1.	1.	1.	1.

1. Although P'/P is not the same quantity as p'/p (*e.g.*, one may be greater while the other is less than unity), it is easily shewn that when the factors g and h are applied to their respective cases, so as to make the sum unity, the resultant values of u'_n are identical.

2. See Census o fthe Commonwealth of Australia, 1911, Vol. II., p. 37, Table 22.

Computed Relative Distribution of Probate Aggregates.

Age-group	MALES.				FEMALES.			
	1881.	1891.	1901.	1911.*	1881.	1891.	1901.	1911.*
0–9	.0000	.0000	.0000	.00000	.0000	.0000	.0000	.00000
10–14	.0002	.0002	.0002	.00012	.0013	.0010	.0008	.00057
15–20	.0008	.0007	.0006	.00059	.0022	.0017	.0013	.00110
21–29	.0105	.0118	.0081	.00804	.0147	.0149	.0108	.00916
30–39	.0306	.0332	.0297	.02429	.0543	.0518	.0469	.03847
40–49	.0910	.0681	.0699	.06956	.1069	.0785	.0748	.07438
50–59	.1852	.1548	.1185	.13863	.1846	.1699	.1253	.13292
60–69	.2545	.2734	.2500	.20752	.2329	.2480	.2424	.19632
70–79	.2667	.2783	.3291	.32274	.2523	.2551	.2871	.30745
80–89	.1513	.1640	.1819	.21420	.1299	.1600	.1905	.21198
90 & over	.0092	.0155	.0120	.01431	.0209	.0191	.0201	.02765
All Ages	1.000	1.000	1.000	1.0000	1.000	1.000	1.000	1.0000

* This distribution is for the aggregate of Victoria, 1908-15; New South Wales, 1911-15; and Queensland, 1916; these being the whole of the available material. The relative weights are: Males, 1.0; females, 0.2368. The epoch to which the results apply is about the beginning of 1914.

The numbers living to 1 dying have been ascertained from the 1911 Census Life Tables, Part XI. of the Report, *vide* pp. 1209-1218, and are shewn for the epochs 1886.0, 1896.0, and 1906.0.[1] By interpolation and extrapolation we obtain values corresponding to the middle of the census years; and these, multiplied by the ratios above given, furnish the variations in the values of k for males and females. In order to combine these, the weights 1 and 0.2368 are used respectively for males and females, and in this way k is found for "persons." The R factors used were as follow:—

Ratios of Living to Dying, Australia.*

Age-group	MALES.				FEMALES.			
	1881.	1891.	1901.	1911.	1881.	1891.	1901.	1911.
10–14	371.9	417.1	450.9	473.3	371.7	468.7	542.4	610.0
15–20	137.5	218.5	288.0	346.0	202.8	276.8	332.5	389.9
21–29	96.1	141.7	193.7	252.1	119.6	166.0	211.2	255.2
30–39	95.8	114.0	140.8	176.2	101.0	119.8	146.7	181.7
40–49	63.5	77.9	89.7	98.9	73.8	97.0	116.3	131.7
50–59	37.7	44.5	51.5	58.7	50.8	60.4	72.2	86.2
60–69	21.6	22.6	24.6	27.6	26.7	23.9	26.6	37.4
70–79	10.9	11.3	11.2	10.6	13.2	13.4	13.5	13.5
80–89	5.5	5.3	5.2	5.2	5.6	5.8	6.1	6.5
90 & over	2.9	2.9	2.8	2.6	2.7	3.0	3.1	3.1
Values of k	25.82	27.75	28.81	31.48	35.11	37.14	38.62	43.51

* See also Table in § 10.

These ratios multiplied into the values of u' given in the preceding table, give the values for k (corrected for largeness of groups, see table of § 5, p. 86) shewn in the last line. If the male results are given the weight 1 and the female the weight 0.2368, *i.e.*, the ratio of the probate-aggregates for males and females respectively, the results for "persons" are:—1881, 27.60; 1891, 29.55; 1901, 30.69; and 1911,

1. More strictly the mean of the periods 1881-1890, 1891-1900, and 1901-1910.

33.78, while the results given in the table of § 25, p. 115, are respectively 24.05; 2.657; 29.35; and 32.74. If we use the general series shewn in § 25 as a basis, and by linear additions make the additions thereto so as to give values equal to these last-computed values, we obtain the results shewn in the table of § 36, p. 130, hereinafter. These have a higher probability than the factors of the table in § 25.

34. **Combined corrections.**—Owing to the fact that the data as regards probates are complete only for "gross values," and that the limitations of the data preclude all possibility of attaining to precision in the estimates of total private wealth from probates, the practical solution may be simplified. Thus it will suffice to take the product of the individual corrections and apply this product to the total for Australia. The product of the corrections for assurance for settlements and for the reduction of gross to net values is 0.96 x 1.209 x 0.862 = 1.0005; hence, we may accept the gross values without correction and apply the values of k thereto to obtain the aggregate of the wealth.

35. **Empirical correction of probate results.**—The question still remains to be settled whether probate results can be expected to agree with census results without further correction. As shewn on p. 28, the aggregate private wealth of Australia was £1,643,463,376. In a district whose population was 77,350, the total debt for males was about 0.00315 of the assets, for females about 0.00124, and for persons 0.00260, the ratio of the numbers in debt compared with those who (as declared) possessed assets being respectively 0.04340, 0.01433, and 0.02978. The total number of returns in this district was 25,932 out of a total population (all ages) of 77,350, *i.e.*, very slightly over one-third. See p. 34 herein. The total number of "not accounted for" in the whole War Census was: males, 1,147,623; females, 1,614,461; or persons, 2,762,084. Any correction for the amount of debt referred to would be insensible compared with the opposite correction for shortage of returns, and may therefore be wholly ignored.

The k factor for the year 1915 is 34.07 (later calculation, 34.99); see § 25, p 115. and the probate aggregate for that year (gross values) is £29,353,000; the product of the two is £1,000,057,000 (or £1,027,061,000); hence, to convert the probate estimate into the census estimate of £1,643,463,376, it is necessary to multiply by 1.6425 (or 1.600161). We could therefore apply this factor to the values of k in the table in § 25 (or 1.60016 to those in the later table), and thus obtain the values shewn in the table hereinafter; see p. 130.

36. **The growth of Australian wealth.**—In the following table are shewn the gross values of both the Testate and Intestate estates in Australia for the years 1878 to 1915 inclusive. The figures for Western Australia were not available from 1878 to 1892, but were estimated in the following manner:—

The average value of all estates in the Commonwealth (less Western Australia) was found for the quinquennia 1878-1882 and 1896-1900. These values were £1844 and £2044 respectively. It was assumed that the average value of estates increased linearly from 1880 to 1898, the annual increase in value being (2044 − 1844)/18 = £11.1. In Western Australia the average value of estates for the quinquennium was found to be £1593. This was then reduced in the ratio of the linearly changing figures referred to, carrying on the change past 1880 to 1898. This method was deemed to be sufficiently accurate for the purpose in view. The figures for Intestate Estates in Tasmania from 1878 to 1884 were computed in a similar manner.

Particulars of Testate and Intestate Estates in 1914 and 1915 were not given separately in the case of New South Wales, but the totals for all estates are given.

Number and Value of Estates of Deceased Persons, 1878 to 1915.

Year.	NUMBERS.																					
	N.S.W.		Vic.		Q'land.		S.A.		W.A.		Tas.		Commonwealth.									
	P.	I.	P.	I.	P.	I.	P.	I.	P.	I.	P.	I.	P.	+	I.	Total.						
1878	1,087	+205	1,341	+255	191	+159	420	+ 52	48	+ 48	142	+ 30	3,229	+	749	3,978						
1879	1,051	195	1,385	219	236	232	480	59	33	33	148	31	3,333		769	4,102						
1880	1,173	212	1,235	204	184	163	471	58	37	37	133	28	3,233		702	3,935						
1881	1,197	300	1,548	186	255	182	464	57	49	49	174	36	3,687		810	4,497						
1882	1,399	280	1,698	220	318	275	543	67	49	49	182	38	4,189		929	5,118						
1883	1,475	283	1,794	238	312	274	553	68	69	69	165	35	4,368		967	5,335						
1884	1,581	320	1,890	212	406	434	624	77	64	64	266	56	4,831		1,163	5,994						
1885	1,620	351	1,938	224	509	352	556	68	72	72	223	57	4,918		1,124	6,042						
1886	1,732	271	2,126	254	488	360	640	79	75	75	246	39	5,307		1,078	6,385						
1887	1,626	319	2,348	310	342	321	608	75	70	70	240	45	5,234		1,140	6,374						
1888	1,665	321	2,276	301	493	288	564	69	73	73	249	54	5,320		1,106	6,426						
1889	1,797	321	2,908	359	406	281	602	74	73	73	225	59	6,011		1,167	7,178						
1890	1,811	331	3,107	347	550	254	694	86	73	73	262	53	6,497		1,144	7,641						
1891	1,959	419	2,711	331	529	197	732	90	96	96	283	49	6,310		1,182	7,492						
1892	2,129	436	3,208	243	577	248	742	91	112	101	281	39	7,049		1,158	8,207						
1893	1,965	390	2,801	200	524	249	654	81	132	128	218	36	6,294		1,084	7,378						
1894	2,163	386	2,805	233	572	198	734	90	112	148	201	48	6,587		1,103	7,690						
1895	2,154	422	3,153	184	539	251	778	96	224	283	180	43	7,028		1,279	8,307						
1896	2,488	463	3,335	270	562	350	811	100	211	413	216	52	7,623		1,648	9,271						
1897	2,210	433	3,291	252	544	305	775	95	328	407	233	50	7,381		1,542	8,923						
1898	2,231	491	3,590	267	640	350	863	106	285	363	196	54	7,805		1,631	9,436						
1899	2,505	461	3,641	223	620	366	876	108	253	261	192	60	8,087		1,479	9,566						
1900	2,452	463	3,961	233	589	168	843	104	265	274	283	78	8,393		1,320	9,713						
1901	2,657	491	3,846	278	594	149	927	114	313	242	229	85	8,566		1,359	9,925						
1902	2,782	552	3,976	270	627	192	913	112	347	247	230	95	8,875		1,468	10,343						
1903	2,767	582	3,884	300	710	378	919	113	399	258	256	105	8,935		1,736	10,671						
1904	2,850	580	3,827	155	588	340	964	119	367	245	295	73	8,891		1,512	10,403						
1905	2,804	540	3,853	191	584	382	902	111	406	264	270	68	8,819		1,556	10,375						
1906	2,852	468	3,982	177	602	406	1,020	126	476	330	343	67	9,275		1,574	10,849						
1907	3,084	595	4,156	172	599	497	975	103	423	300	414	70	9,661		1,737	11,398						
1908	3,094	583	4,105	240	706	492	1,011	120	455	301	346	98	9,717		1,834	11,551						
1909	3,185	598	3,831	238	679	572	1,085	149	413	275	361	95	9,554		1,927	11,481						
1910	3,336	625	3,870	258	704	539	1,110	196	492	304	375	100	9,887		2,022	11,906						
1911	3,589	656	4,265	349	729	623	1,057	127	584	306	399	88	10,623		2,143	12,766						
1912	3,617	785	4,267	318	755	659	1,214	145	552	312	465	116	10,870		2,335	13,205						
1913	4,279	835	4,185	298	765	782	1,373	147	580	292	459	61	11,641		2,415	14,056						
1914	*4,438		4,070	381	831	646	1,418	181	577	330	402	84	..		..	13,358						
1915	*5,088		4,011	438	896	673	1,515	157	682	268	455	64	..		..	14,247						

Year.	GROSS VALUE.																					
	N.S.W.		Vic.		Q'land.		S.A.		W.A.		Tas.		Commonwealth.									
	P.	I.	P.	I.	P.	I.	P.	I.	P.	I.	P.	I.	P.	+	I.	Total.						
	(£1,000.)		(£1,000.)		(£1,000.)		(£1,000.)		(£1,000.)		(£1,000.)		(£1,000.)		(£1,000.)	(£1,000.)						
1878	2,016	+17	2,919	+37	218	+ 8	411	+ 4	66	+ 2	254	+ 5	5,884	+	73	5,957						
1879	2,387	11	2,666	46	281	15	662	6	46	1	313	5	6,355		84	6,439						
1880	1,534	24	1,890	28	144	13	342	3	52	1	260	5	4,222		74	4,296						
1881	2,319	28	2,935	78	163	9	719	7	69	2	303	6	6,508		130	6,638						
1882	4,168	23	3,483	30	534	8	1,087	10	69	2	171	6	9,512		79	9,591						
1883	4,117	35	3,748	35	460	14	869	8	98	3	172	6	9,464		101	9,565						
1884	4,248	29	5,114	36	662	11	660	6	92	2	264	10	11,040		94	11,134						
1885	4,323	24	4,298	30	693	18	702	6	104	3	249	9	10,369		90	10,459						
1886	5,496	13	4,532	26	643	14	698	6	110	3	220	10	11,699		72	11,771						
1887	4,263	21	5,201	44	835	11	584	5	103	3	284	10	11,270		94	11,364						
1888	4,291	16	7,027	36	1,087	14	365	3	108	3	241	7	13,119		79	13,198						
1889	4,791	39	11,252	35	670	13	1,137	10	109	3	297	7	18,256		107	18,363						
1890	7,528	72	8,667	36	1,081	12	1,071	10	110	3	528	7	18,985		140	19,125						
1891	5,457	65	7,582	31	848	10	684	6	145	3	411	9	15,127		124	15,251						
1892	5,769	26	9,670	26	860	14	1,138	10	171	6	269	9	17,877		91	17,968						
1893	4,144	16	6,232	13	1,123	9	786	7	203	5	236	9	12,724		59	12,783						
1894	5,299	17	5,419	24	641	7	1,733	16	174	6	261	8	13,527		78	13,605						
1895	4,858	24	5,340	24	1,105	6	1,560	14	349	13	217	5	13,428		86	13,514						
1896	6,695	18	6,091	20	1,384	12	1,161	11	291	14	205	7	15,827		82	15,909						
1897	5,925	23	5,782	23	1,988	12	2,083	19	554	12	378	13	16,710		102	16,812						
1898	5,926	25	6,269	32	1,228	16	2,375	22	659	11	241	9	16,698		115	16,813						
1899	5,064	27	5,920	22	2,613	47	1,155	11	274	9	556	5	15,582		122	15,704						
1900	4,731	23	6,919	27	1,085	5	1,378	13	360	9	406	10	14,879		87	14,966						
1901	7,033	33	6,527	18	1,594	6	1,457	13	616	9	402	10	17,629		89	17,718						
1902	5,807	34	7,571	22	1,079	10	1,790	16	488	11	299	17	17,034		110	17,144						
1903	7,180	25	6,088	30	2,617	15	2,464	22	703	11	353	15	19,305		118	19,423						
1904	6 156	41	5,783	14	1,513	20	2,057	19	423	16	905	6	16,837		116	16,953						
1905	7,715	31	6,017	21	1,016	15	1,295	12	677	12	504	4	17,224		95	17,319						
1906	7,529	22	6,434	30	1,795	16	2,041	19	545	10	862	5	19,206		102	19,308						
1907	7,563	36	6,860	18	1,358	17	1,924	18	1,154	8	841	8	19,700		105	19,805						
1908	7,839	29	8,362	22	1,376	18	2,077	13	956	7	1,024	11	21,634		100	21,734						
1909	11,142	50	7,790	16	1,509	19	1,929	19	939	8	722	9	24,031		121	24,152						
1910	8,835	40	8,478	17	1,653	19	2,397	24	869	8	798	9	23,030		117	23,147						
1911	13,138	46	9,713	28	2,409	43	2,855	20	844	8	597	7	29,556		152	29,708						
1912	10,722	54	9,697	26	2,730	36	2,291	25	842	13	984	3	27,266		157	27,423						
1913	11,756	68	9,578	26	2,640	21	2,733	15	796	7	729	13	28,232		150	28,382						
1914	*9,998		9,579	18	2,640	70	3,522	32	1,010	8	731	11	..		..	27,619						
1915	*10,814		9,982	27	2,721	92	3,372	45	1,272	13	1,005	10	..		..	29,353						

* Probate and Intestate Estates combined; separate figures not available.

Re-seals and re-grants have been included in every State except Victoria, which includes value, but excludes the numbers, and South Australia, where second grants are excluded.

Particulars relating to Intestate Estates in South Australia were not available till 1907. The figures from 1878 to 1906 were computed on the assumption that the proportion of Intestate to Testate Estates in each year from 1878 to 1906 was the same as the proportion of the aggregate figures for 1907 to 1915.

Applying to the quinquennial means of the aggregates the deduced factors referred to in § 33, and the corrections referred to in §§ 34 and 35, we obtain the following results, viz. :—

Estimate of the Growth of Private Wealth in Australia from 1878 to 1915.

Year.	Increased Total, £1,000.*	Value of *k*.	Total Wealth, £1,000† (Means).	Year.	Increased Total, £1,000.*	Value of *k*.	Total Wealth, £1,000† (Means).	Year.	Increased Total, £1,000.*	Value of *k*.	Total Wealth, £1,000† (Means).
1878	9,532	27.06	257,940	1891	26,719	29.55	750,053	1904	28,849	31.49	912,319
1879	8,903	27.25	263,146	1892	25,198	29.65	745,287	1905	29,702	31.74	953,149
1880	10,535	27.42	295,713	1893	23,401	29.76	727,015	1906	30,440	32.03	1,001,768
1881	11,691	27.60	328,978	1894	23,610	29.87	716,679	1907	32,744	32.31	1,069,557
1882	13,192	27.78	375,118	1895	23,240	29.98	719,479	1908	34,608	32.59	1,151,441
1883	15,163	27.98	415,858	1896	24,530	30.08	735,789	1909	37,938	32.88	1,244,216
1884	16,808	28.16	457,174	1897	25,203	30.20	754,506	1910	40,375	33.49	1,329,933
1885	17,375	28.35	503,755	1898	25,667	30.31	776,234	1911	42,500	33.78	1,417,901
1886	18,538	28 55	555,633	1899	26,243	30.44	795,540	1912	43.619	34.08	1,484,188
1887	20,853	28.74	606,824	1900	26,355	30.56	814,079	1913	45,600	34.38	1,542,448
1888	23,625	28.94	665,933	1901	27,188	30.69	835,446	1914	45,526	34.68	1,596.678
1889	25,027	29.14	717,994	1902	27,587	30.95	857,374	1915	46,970	34.99	1,643,464
1890	26,852	29.35	747,552	1903	28,340	31.22	884,844	1916	..	35.30	..

* Amount of probates multiplied by 1.60016. † Means for the quinquennium of which the year in question is the central year. The amounts for 1878 and 1915 are for the single year and 1.

37. **Comparison with other estimates of private wealth.**—Sir T. A. Coghlan, F.S.S. (then Mr. Coghlan), made, when Statistician of New South Wales, estimates of the private wealth of Australia for various dates, and Mr. A. M. Laughton, F.I.A., F.F.A., F.S.S., Government Statist, Victoria, has also given estimates for recent years. They are as shewn hereunder, and for purposes of comparison the estimates now obtained are also given :—

Year.	Coghlan.	Knibbs.	Year.	Coghlan.	Knibbs.
	£1,000.	£1,000.		£1,000.	£1,000.
1813*	1	..	1890†	1019.2	747.6
1838*	26	..	1903†	982.0	884.8
1863*	163	..		Laughton.	
1878	..	257.9	1911‡	990.	1417.9
1888†	875	665.9	1911§	1031.	1417.9

* T. A. Coghlan.—The Seven Colonies of Australasia, 1893. The figure for 1863 has been deduced from the result for Australasia, correcting by the ratio of populations (Australia/Australasia).
† T. A. Coghlan.—The Seven Colonies of Australasia, 1903-4.
‡ A. M. Laughton.—Vict. Year Book, 1911-12, p. 217 ; 1912-13, p. 271 ; 1913-14, p. 591.
§ A. M. Laughton.—Vict. Year Book, 1914-15, p. 233 ; 1915-16, p. 295.

38. **Probate and general distribution of wealth according to size of estate.**—The distribution according to size of estates, of estates appearing in probate-returns, is not identical with a distribution for the whole community : nevertheless it could be ascertained if only the distributions for age-groups (within small limits of age) were tabulated.

Suppose that m_x, m'_x, m''_x, etc., be the numbers of persons of age x who are shewn on the probate-returns as possessing wealth between ranges 0 to v, v to v', v' to v'', etc., and that R_x be the ratio of the living to the dying (R_x = the reciprocal

of the death-rate at age x, either a year say, or a five or ten-year range of ages). Then the numbers for the corresponding ranges among the living (on the assumption that the dying are a fair sample of the living) are $R_x m_x$, $R_x m'_x$, $R_x m''_x$, etc.

If we compile for all ages the numbers in each range, we have for the dying—

$$m_x + m_{x+1} + m_{x+2} + \text{etc.}\,; \quad m'_x + m'_{x+1} + m'_{x+2} + \text{etc.}\,;$$
$$m''_x + m''_{x+1} + m''_{x+2} + \text{etc.}$$

But in the corresponding compilation for the living we have, on the assumption mentioned :—

$$(34)\ldots\ldots (R_x m_x + R_{x+1} m_{x+1} + R_{x+2} m_{x+2} + \text{etc})\,;$$
$$(R_x m'_x + R_{x+1} m'_{x+1} + R_{x+2} m'_{x+2} + \text{etc.})\,;$$
$$(R_x m''_x + R_{x+1} m''_{x+1} + R_{x+2} m''_{x+2} + \text{etc.})\text{; etc., etc.}$$

If the numbers between given ranges of net-values of estates for each age-group are kept, the grouping for all ages taken together can approximately be found. If, however, the group (for all ages) be formed from the probate-returns treated as a whole, one cannot obtain the general distribution by multiplying these by any general constant, as, for example, the weighted mean of R_x, R_{x+1}, etc., say R_0, for this would give :—

$$(35)\ldots\ldots (R_0 m_x + R_0 m_{x+1} + R_0 m_{x+2} + \text{etc.})\,;$$
$$(R_0 m'_x + R_0 m'_{x+1} + R_0 m'_{x+2} + \text{etc.})\,;$$
$$(R_0 m''_x + R_0 m''_{x+1} + R_0 m''_{x+2} + \text{etc.})\,; \quad \text{etc., etc.,}$$

which is obviously not identical with (34) above.

The dissimilarity of the two distributions referred to in the previous demonstration is revealed by making a comparison between the results as given by the War Census and in the probate-returns :—

Distribution of Estates in Probate-returns and in War Census compared, for the State of Victoria.

Range.	Victorian War Census, No. of Estates, 30th June, 1915	Victorian Probate Returns, 1908-15.	War Census, 21,070 Cases over £300.	Prussia, 1913 Census.†	Range.	Victorian War Census, No. of Estates, 30th June, 1915	Victorian Probate Returns, 1908-15.	War Census, 21,070 Cases over £300.	Prussia, 1913 Census.†
Not accounted for or in debt	839,250	89,415	..	..	4,000–5,000	3,923	685	490	717
					5,000–10,000	7,935	1,442	992	1,325
Under £100 ..	295,412	5,591	36,920	?	10,000–15,000	2,113	430	264	407
100–300* ..	120,168	8,463	15,019	?	15,000–25,000	1,403	247	175	305
					25,000–50,000	798	168	100	207
300–500 ..	43,190	5,015	5,398	4,162	50,000–100,000	313	63	39	140
500–1,000 ..	51,765	5,585	6,470	4,876	Over 100,000	170	40	21	
1,000–2,000 ..	36,746	4,444	4,594	5,275	(Over £300)	(168,588)	(21,070)	(21,070)	(21,070)
2,000–3,000*	12,181	1,873	1,522	2,429					
3,000–4,000*	8,051	1,078	1,006	1,227	Totals, etc.	1,423,418	124,539	..	602,243†

* Interpolated values from the Census results.
† 21,070 cases correspond to a population of 602,243 persons; the total population was about 40,740,000.

In the above table the fourth columns give the equivalent distribution of 21,070 estates according to the War Census results. The results for Prussia appear to agree rather with the probate-distribution in Victoria than with the census-distribution.

39. **Conclusions regarding the probate method.**—(i.) Even when the data of a single year are complete, the probate method cannot be relied upon to give a satisfactory estimate of wealth existing at that year, because, whatever size the community, the appearance of large estates in probate-returns must necessarily be irregular.

(ii.) Though the use of quinquennial averages diminishes this irregularity, it is insufficient to reduce it to an insensible amount : even the combination of the data for 10 years will not always effect this.

(iii.) For precision the probate-records of each sex must be considered separately : the use of a general multiplier is not rigorously exact.

(iv.) To obtain results of high accuracy a record of all settlements, including all marriage settlements—which latter are rarely recorded—is an essential. If the proportion of settlements to probates be large, it is further necessary that the ages of donors and donees also be given, otherwise, the uncertainty of the result will be appreciable. The effect of settlements in disturbing the normal distribution of wealth requires special investigation.

(v.) To estimate the wealth in any age-group, the ratio of living to the dying should be the weighted average for the period considered, and inasmuch as this ratio sensibly changes from year to year, account should be taken of the change.

(vi.) A correction is necessary in order to allow for the fact that, from the standpoint of averages, life insurance unduly increases the probate-return, and to that extent creates a wealth-differentiation between the living and dying. Existing statistics admit of only a rough correction.

(vii.) Net values are necessary in all cases where precision is required : it is not satisfactory to correct by a general factor of reduction (gross to net values).

(viii.) Statistics are needed, to shew whether death-rates vary with the wealth of individuals : without this the rigour of the method is uncertain. Such statistics are not at present available.

(ix.) An estimate made in respect of an average taken over a quinquennial or a decennial period may with advantage be ordinarily assigned to the middle of the period, but is not the value as at that particular date.

(x.) In Australia the probate-method cannot lead to satisfactory results owing to the absence of the necessary data regarding settlements. This defect introduces great uncertainty into determinations from probates, a fact forcibly illustrated by the necessity of applying a correction-factor of about 1.6 to the results obtained from probates, in order to bring them into agreement with the estimates obtained by the War Census.

40. **Graphical representation.**—The accompanying graphs furnish representations of some of the leading features of the matter treated in the present part.

Age Distribution of Wealth disclosed by Probate Returns, Victoria (1908-15).

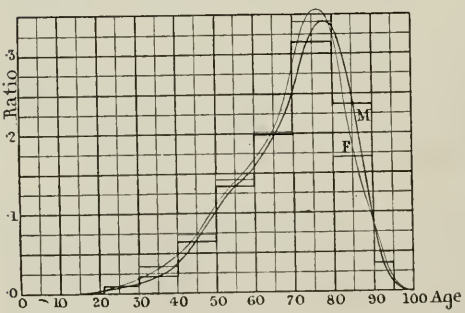


Fig. 4.

The accompanying figure (Fig. 4) furnishes for each sex the representation of the relative distribution according to age of the wealth disclosed by probate returns in the experience of Victoria (1908-15).

The heavy curved line marked M relates to males, the light line marked F to females. In each case the total area included between the curve and the base line is equal to 1. The area enclosed by any two ordinates and the portions of the curve and base cut off thereby represent the proportion of the total wealth for the sex in question attributable to testators between the ages represented by the selected ordinates (see page 109).

Fig. 5 furnishes a representation of the ratio to deaths of the number of estates subject to probate. The continuous lines relate to Victorian experience (1908-15), and the broken lines to New South Wales experience (1911-13). The two upper curves marked M relate to males, while the two lower marked F relate to females. As an alternative representation for Victorian males a dot-and-dash line is shewn, which is probably a more correct indication of the trend than the closer-fitting, but wavy, continuous line. The curves are, in the main, based on decennial aggregates, while those shewn for Victoria in Fig. 10, on page 135, are based on returns for each year (see pp. 109, 110).

Ratio of Probates Estates to Deaths.
Victoria, 1908-15. N.S.W., 1911-13.

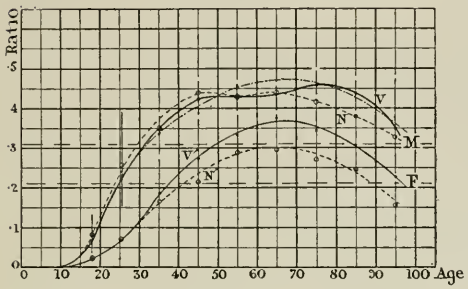


Fig. 5.

The accompanying graph (Fig. 6) furnishes a representation of the average wealth per estate for each age, based upon the Victorian probate experience for the eight years 1908-15, and the New South Wales experience for the three years 1911-13. The Victorian results are represented by continuous lines, and the New South Wales results by dotted, the male and female results being denoted in each case by the letters M and F respectively. The small circles in the case of Victoria, and the dots in the case of New South Wales, indicate the position for the group plotted usually as at the central point (see pp. 109, 110).

Average Wealth per Estate.
Victoria, 1908-15. N.S.W., 1911-13.

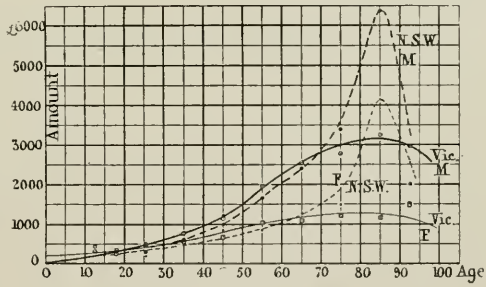


Fig. 6.

Ratio of Net to Gross Values of Estates subject to Probate.

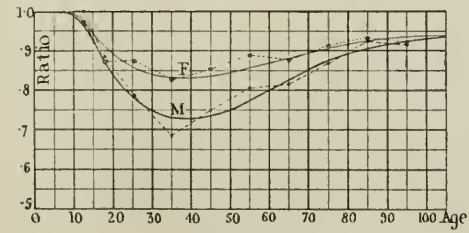


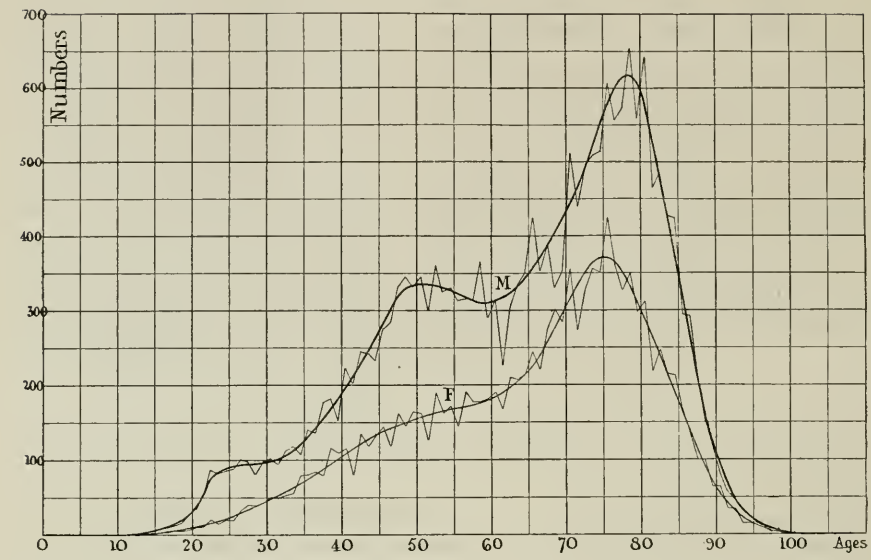
Fig. 7.

In Fig. 7 the smoothed curve M denotes the ratios of the net to the gross value according to age, for males, and the smoothed curve F denotes the ratios for females. The ratios as given by the crude data are shewn by the small circles joined by dotted lines.

The particulars represented in this figure relate to Victoria for the five years 1908-12 (see page 118).

Numbers and Values of Estates subject to Probate, according to Age. Victoria, 1908-15.

Fig. 8.



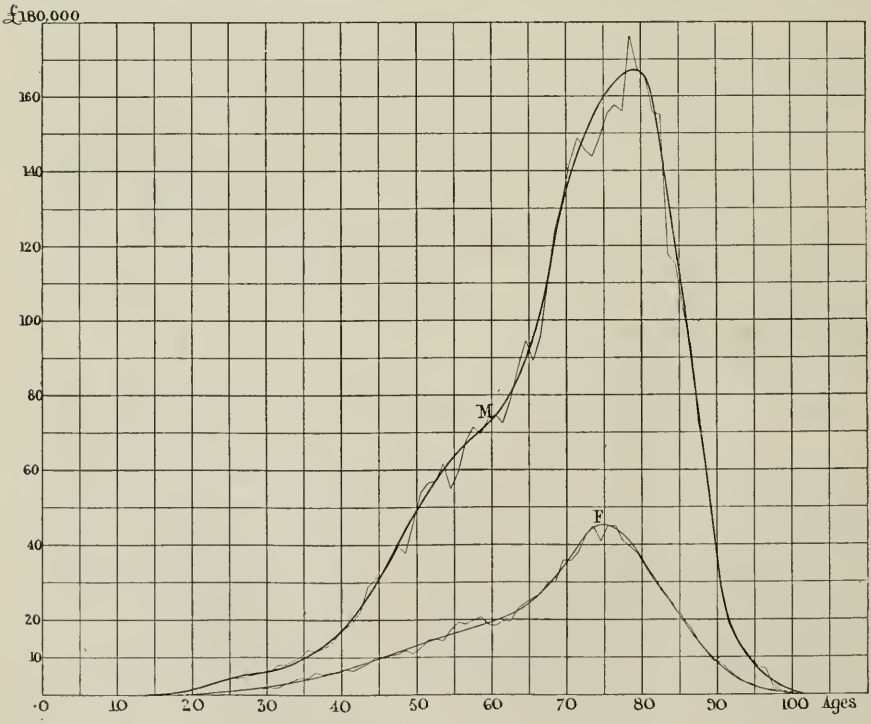


Fig. 9.

Fig. 8 shews the numbers of estates subject to probate in Victoria during the period 1908-1915 per year of age; the curve marked M giving the numbers for males, and that marked F for females.

Fig. 9 shews the aggregate net values of the estates subject to probate during the period 1908-1915 per year of age; the curve marked M indicating the aggregate for males, and that marked F for females. (See pp. 122 to 125.)

Average Net Wealth per Estate subject to Probate, according to Age, and the Ratios of such Estates to Total Deaths. Victoria, 1908-15.

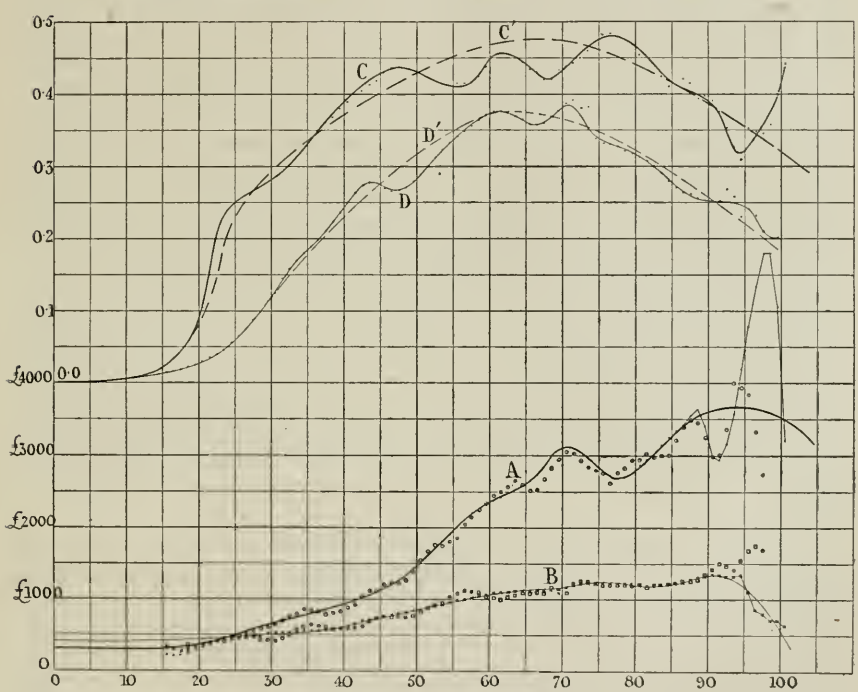


Fig. 10.

Curve A shews, according to age, the average net wealth per estate subject to probate for males; and curve B for females. (See the text, page 121, for the significance of the dots, crosses, small circles, and small squares.)

Curve C shews, for males, the ratios of the number of estates to the total deaths at each age, and curve D furnishes a similar representation for females. (See the text, page 121, for the significance of the dots.)

Curves C′ and D′ are the general indication, for males and females respectively, of the variation with age of these ratios. (See page 121.)

PART VI.—THE INVENTORY METHOD OF ESTIMATING WEALTH.

CHAPTER I.—ESTIMATE OF AUSTRALIAN PRIVATE WEALTH FOR 1915.

1. **General.**—Of the various methods of estimating the wealth of the community the inventory method is that which furnishes most readily a comprehensive view of the various classes of wealth constituting the aggregate. In this respect it has advantages which do not attach to either the succession (probate) method or the census method. The possibility of using it, however, is largely dependent on the existence of valuations of various kinds made for purposes other than the estimation of total wealth, as, for example, Local Government assessments, values of imports, values of plant and machinery engaged in various industries, etc. Further, in certain of the items direct valuation is not possible, and estimates based on indirect data and general knowledge must be employed, as, for example, an estimate of the value of clothing based on the known number of persons, and an assumed value per head, or a valuation of furniture based on the number of houses of various sizes or of various rental values. It is thus clear that, in common with all other estimates of wealth, the inventory method is involved in some measure of uncertainty, but it is doubtful whether this is more marked than in the case of other methods. On the other hand it has the advantages (i.) that it enables a fair idea to be obtained of the degree of uncertainty involved in each item, (ii.) that unlike a census it costs little to compile and can consequently be prepared at relatively short intervals, (iii.) that it relates approximately to a definite point of time, whereas a "succession" estimate at its best can only give the average for an extensive period if it is to be at all reliable.

2. **Basis of estimate.**—In the accompanying estimate provision has been made for the inclusion of all material private wealth existing in Australia, whether owned by persons domiciled in Australia or by those resident abroad, but *public property whether national or communal has been omitted.* Owing to this scheme it might possibly be considered necessary to include in the aggregate an item representing the securities for loans to Commonwealth and State Governments, and to public bodies, which are held in Australia, since such holdings will in all cases be included in succession returns and census results, and should thus be included to justify a comparison of the results obtained by the several methods. Although such inclusion might appear out of place in what is essentially a valuation of material objects, it might, perhaps, be possible to justify it on the view that the amount so included *represents the portion of the national and communal property for which private investors resident in Australia hold certificates of title* in the shape of bonds, debentures or stock.

It is not clear, however, that a similar contention in favour of including the Australian public debt held outside the Commonwealth would not have equal validity. In view of all the circumstances it was decided to omit any reference to the public debt in the main estimate, but to refer to it later in making comparisons with the succession and War Census results.

In broad outline the classes of private wealth contributing to the aggregate may be classed as follows :—

(i.) Land and Improvements; (ii.) Live Stock; (iii.) Agricultural, Dairying and Pastoral Implements and Machinery; (iv.) Manufacturing Plant and Machinery; (v.) Mining Properties (including plant and machinery); (vi.) Coin and Bullion; (vii.) Private Railways and Tramways; (viii.) Shipping; (ix.) Agricultural and Pastoral Products; (x.) Locally manufactured products; (xi.) Mining Products (other than gold); (xii.) Imported Merchandise; (xiii.) Clothing and personal adornments; (xiv.) Furniture and fittings, books, pleasure vehicles, etc.

3. **Details of Estimations.**—(i.) *Land and Improvements.*—The estimate in respect of this item is based on the municipal valuations of the several States and represents about two-thirds of the total estimated wealth. The form in which this information would be most serviceable is that of improved capital value, but unfortunately particulars of this nature are available for the whole State in the cases of Victoria and South Australia only. Similar information in the cases of New South Wales and Western Australia is furnished for "municipalities" only, the assessments for "shires" in New South Wales and for the majority of the "road districts" in Western Australia being upon an unimproved basis. In Queensland all the assessments are based upon unimproved values, while in Tasmania and in a few of the Western Australian road districts the figures given relate to "annual values." It is thus necessary in several cases to apply certain factors for the purpose of converting "unimproved" and "annual values" into the corresponding "improved capital values."

(*a*) *New South Wales.*—The valuation of the municipalities of New South Wales for the year ended 31st December, 1915, furnished the following results :—

New South Wales.—Valuation of Municipalities for Year ended 31st Dec., 1915.

Municipalities.	Improved Capital Value.	Un-improved Capital Value.	Assessed Annual Value.	Percentage of Un-improved on Improved Capital Value.	Percentage of Assessed Annual Value on Improved Capital Value.
	£	£	£	%	%
Sydney	78,580,300	27,226,283	3,391,759	34.65	4.32
Metropolitan Suburbs	91,198,244	33,403,223	6,686,058	36.63	7.33
Newcastle & Suburbs	8,417,087	3,193,866	534,948	37.94	6.36
Country Municipalities	49,532,471	19,649,329	3,660,862	39.67	7.39
Total, Municipalities	227,728,102	83,472,701	14,273,627	36.65	6.27

In the New South Wales Statistical Register for 1915 (p. 783), from which the valuation figures given above have been taken, the following definitions of the three classes of valuation are furnished :—

"The *Unimproved Capital Value* of land is the amount which the fee simple estate in such land is worth under such reasonable conditions as a *bona fide* seller would require, assuming the actual improvements had not been made."

"The *Improved Capital Value* is the amount which the fee simple estate of the land is worth, with all improvements and buildings thereon."

"The *Assessed Annual Value* is nine-tenths of the fair average rental of land with improvements thereon."

The total area embraced by these municipalities is 2913 square miles, or less than 1 per cent. of the total area of the State, while the population contained therein represented more than 64 per cent. of the total population of the State.

With the exception of a portion of the sparsely populated Western Land Division the remainder of the State is divided into shires, which cover a total area of 180,655 square miles, or somewhat more than 58 per cent. of the whole area of the State, the population of this portion representing nearly 35 per cent. of the total for the State. The unincorporated area of the Western Land Division covers an area of 125,893 square miles, or rather more than 40 per cent. of the area of the State. Its population, however, is rather less than 1 per cent. of the total population of New South Wales.

As regards shire valuations for 1915, the unimproved capital value is available in all cases, and aggregates £104,745,633. Improved capital values which are available for eleven shires aggregate £21,412,096, the unimproved values for the same shires totalling £9,599,892, or 44.83 per cent. of the corresponding improved values. There were ten cases in which improved capital values and assessed annual values were both given, the improved values aggregating £18,088,565, and the corresponding assessed annual values £822,201, or 4.88 per cent. of the improved value. On the assumption that the eleven shires, quoted above as giving a percentage of 44.83 for the ratio of unimproved to improved value, may be taken as a fair sample in this respect of the shires of New South Wales, the multiplier for converting the aggregate unimproved value for shires into the corresponding improved value will be 100 ÷ 44.83. Applying this factor the improved capital value for shires works out at £233,650,000. It may be noted that the ratio of unimproved to improved capital value obtained at the War Census of 1915 for owners domiciled in New South Wales was 44.91 per cent.

In the case of the unincorporated portion of the Western Land Division an estimate of £10,000,000 unimproved value is quoted in the Official Year Book of New South Wales for 1915 (p. 587), as being within reasonable limits. This estimate is apparently based on the assumption that an unimproved value of 2s. 6d. per acre might be taken as applying to the whole of the area of slightly more than eighty million acres contained in the Western Division. Although this estimate might be appropriate for certain purposes, it appears somewhat high for adoption in the present case, and it was considered desirable to prepare an estimate on the basis of the population of the unincorporated area taken in conjunction with the average unimproved value per head disclosed by the contiguous shires. These are the shires of Boomi, Walgett, Marthaguy, Bogan, Lachlan, Carathool, Waradgery and Wakool, which in 1915 had an aggregate population of about 21,200, and an aggregate unimproved valuation of £9,176,669, or £433 per head. As the population of the unincorporated area of the Western Division in 1915 was about 16,000, the corresponding unimproved value would on this basis be £6,928,000. Particulars in respect of the ratio of "unimproved" to "improved values" are not available for this part of the State separately, but as it would be relatively high it has been taken at 60 per cent., giving an estimated improved value for the unincorporated area of £11,547,000.

Combining these results, the total for the State works out as follows :—

Estimated Improved Capital Value, New South Wales, 1915.

Municipalities.	Shires.	Unincorporated Area.	Total.
£227,728,000	£233,650,000	£11,547,000	£472,925,000

This total represents an average of £253 per head of the mean population of the State for the year 1915.

(*b*) *Victoria.*—In the case of Victoria the particulars available relate to improved capital values, and also to annual values for all local government areas. The figures for 1915 are as follows :—

Victoria.—Local Government Valuations for Year 1915.

Local Governing Districts.	Improved Capital Value.	Annual Value.	Percentage of Annual Value on Improved Capital Value.
	£	£	%
Cities, Towns and Boroughs ..	147,205,224	8,218,040	5.58
Shires	167,405,523	8,517,938	5.09
Total	314,610,747	16,735,978	5.32

With the exception of French Island in Western Port Bay, the whole of Victoria is under local government. The total given above (in round numbers £314,611,000) may consequently be taken as fairly representing the total value of real property and improvements for 1915. It averages £221 per head of the mean population of the State for that year.

(*c*) *Queensland.*—The municipal valuations for Queensland relate solely to unimproved capital values, and are separately available for the year 1915 for the 10 cities, 27 towns and 147 shires which amongst them comprise the whole area of the State. The particulars are as follows :—

Unimproved Values, Queensland, 1915.

Cities.	Towns.	Shires.	Total.
£11,717,227	£4,683,948	£45,622,388	£62,023,563

In the absence of any valuation data for Queensland indicating the relation between " unimproved" and " improved" values, it is necessary to make use of the ratio for that State obtained from a comparison of the War Census data. The ratio so obtained for owners of freehold property who were domiciled in Queensland was 48.13 per cent. This ratio relates to the State as a whole, and in view of the varying ratios given above on p. 137 for municipalities and shires in New South Wales, it would clearly be inadmissible to apply the factor separately to the figures for cities, towns and shires in the preceding table. Applying it to the total of £62,023,563 gives the improved capital value for Queensland as £128,867,000, averaging £187 per head of the mean population of the State for 1915.

(*d*) *South Australia.*—In the case of South Australia the improved capital values and the annual values of all ratable property for the year 1915 are given separately for the several corporations and district councils. The details are as follows :—

South Australia.—Municipal Valuations, 1915.

Local Governing Districts.	Improved Capital Value.	Annual Value.	Percentage of Annual Value on Improved Capital Value.
	£	£	%
Metropolitan—			
Corporations	32,037,714	1,597,957	4.99
District Councils	11,652,652	588,632	5.05
Country—			
Corporations	6,109,840	320,299	5.24
District Councils	40,715,301	2,012,666	4.94
Total	90,515,507	4,519,554	4.99

Of the several Australian States, South Australia has by far the largest unincorporated area. Thus, while corporations account for 81 square miles, and district councils for 45,586 square miles, the unincorporated area amounts to no less than 334,403 square miles, or 88 per cent. of the whole area of the State. This area is, however, very sparsely populated, and much of it is entirely unoccupied. At the Census of 1911 the total population of the unincorporated portion of the State was only 11,908 persons, or less than 3 per cent. of the total population of the State. In the area under country district councils for 1915, the average capital value of ratable property per head of population was approximately £232. Assuming this average to be applicable to the unincorporated area, and taking the population of that area at about 12,000 for 1915, the estimated improved capital value for this portion of the State may be set down at £2,784,000.

The total for South Australia may thus be given as follows :—

Improved Capital Value, South Australia, 1915.

Corporations.	District Councils.	Unincorporated Area.	Total.
£38,148,000	£52,368,000	£2,784,000	£93,300,000

This total gives an average of £212 per head of the mean population of the State for 1915.

(*e*) *Western Australia.*—In this State the valuations of the municipalities are available in respect of what are termed " Capital value, including improvements," and " Net Annual Value." The totals for the year ended 31st October, 1915, are as follows :—

Western Australia.—Municipal Valuations, 1915.

Districts.	Improved Capital Value.	Net Annual Value.	Percentage of Net Annual Value on Improved Capital Value.
	£	£	%
Metropolitan Municipalities ..	19,945,078	1,098,587	5.51
Extra-Metropolitan „ ..	4,976,344	439,038	8.82
Total, Municipalities ..	24,921,422	1,537,625	6.17

In the case of the Road Districts which correspond approximately to the shires in some other States, rates are levied in part on " annual values," but mainly on " unimproved values," both bases being used in some districts. For the whole State the " annual values" recorded for the year ended 30th June, 1915, were £327,709, while the " unimproved values" for the same year totalled £14,142,879. As indicated in the preceding table, the ratio of "net annual value" to "improved capital value" works out at 8.82 per cent. for extra-metropolitan municipalities in Western Australia, but such a ratio is certainly too high in the case of road districts. In the case of New South Wales the ratio for country municipalities was 7.39 per cent., while that ascertained for eleven shires for which the information was available was 4.88 per cent., or about one-third less. Assuming the same relation to hold between the extra-metropolitan municipalities and the road districts in Western Australia, the appropriate percentage would be two-thirds of 8.82, or 5.88. It was consequently decided to take 6 per cent. as fairly applying to the case. At the War Census of 1915 the ratio of " unimproved" to " improved" capital value in respect of property owners domiciled in Western Australia was 40.55; as this was based on a combination of town and country properties, it is probably too low for use in connection with country properties only. The factor to be applied in converting the " unimproved values" quoted above into " improved values" has consequently been based upon a ratio of 45 per cent. As a result of these computations the " improved capital value" for road districts has been estimated at £36,891,000. Combining these results the total for Western Australia may be stated as follows, the whole of the State being incorporated :—

Improved Capital Value, Western Australia, 1915.

Municipalities.	Road Districts.	Total.
£24,921,000	£36,891,000	£61,812,000

This total represents an average of £192 per head of the mean population of the State for 1915.

(*f*) *Tasmania.*—In this case the municipal valuations available relate to " annual values" only, and total £1,654,654 for the year 1915. For the purpose of estimating the corresponding improved capital values, it is necessary to use a factor based on the experience of other States. As indicated above, the percentages of assessed annual values on improved capital values averaged as follows :—(i.) New South Wales municipalities, 6.27%; (ii.) New South Wales shires, (11 only), 4.88%; (iii.) Victorian cities, towns and boroughs, 5.58%; (iv.) Victorian shires, 5.09%; (v.) South Australian local governing bodies, 4.99%; (vi.) Western Australian municipalities, 6.17%. In view of these results it appears that 5%, which is practically the ratio for South Australia, might reasonably be adopted as applicable to the Tasmanian data. On this basis the improved capital value works out at £33,093,000, and averages £166 per head of the mean population of the State for 1915.

(*g*) *Territories.*—Owing to their exceptional conditions the Northern and the Federal Territories furnish no data relative to local government corresponding to that quoted above in respect of the several States. Their omission from the estimate for Australia would not seriously affect the total, but for the sake of completeness it appears desirable to include them. It has consequently been deemed appropriate to compute a figure based upon the population in each case, and taking an average

value per head indicated by the State estimates. In the Northern Territory the mean population for 1915 was 4403, while the corresponding figure for the Federal Territory was 2467. The average values per head of mean population disclosed above for the several States are as follows :—New South Wales, £253 ; Victoria, £221 ; Queensland, £187 ; South Australia, £212 ; Western Australia, £192 ; and Tasmania, £166. In view of these averages it will probably be within the mark to assume an average of £150 per head for the Territories. This will give approximately £660,000 for the Northern Territory, and £369,000 for the Federal Territory.

(*h*) *Commonwealth.*—Combining the results obtained in foregoing sub-sections, the results for the Commonwealth may be stated as follows in thousands of pounds :—

Improved Capital Value, Commonwealth, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
472,925	314,611	128,867	93,300	61,812	33,093	660	369	1,105,637

For the Commonwealth as a whole the average value per head of mean population for 1915 was £223 7s.

(ii.) *Live Stock.*—Particulars concerning the value of live stock in the several States are not directly available, but the numbers of each of the principal classes and some of the minor classes are collected annually in each State and Territory. The dates to which these records relate are not uniform, but in each case the figures used for the present purpose refer to a point of time between 30th June, 1915, and 31st March, 1916, thus making appropriate allowance for the losses of the 1914-15 drought. The figures so taken for the principal classes of stock are as follows :—

Numbers of Principal Classes of Australian Live Stock, 1915-16.

Kind of Stock.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
Horses	731,735	493,779	686,871	253,333	163,016	41,422	19,957	1,310	2,391,423
Cattle ..	2,472,631	1,043,604	4,780,893	226,565	821,048	169,575	483,961	5,666	10,003,943
Sheep ..	32,874,359	10,545,632	15,950,154	3,674,547	4,803,850	1,624,450	57,827	102,683	69,633,502
Pigs ..	286,478	192,002	117,787	66,237	58,231	37,778	500	289	759,302

For the valuation of this stock it was decided to adopt with slight amendments the standard values prescribed by the Federal Taxation Department for use in the preparation of income-tax returns. The amendments referred to above consisted in (i.) the substitution of a State rate for the standard district rates for sheep and cattle in Western Australia, (ii.) the insertion of rates for horses and pigs in Western Australia, (iii.) the insertion of a rate for pigs in the Northern Territory, (iv.) the insertion of rates for the Federal Territory identical with those for New South Wales. The values so adopted were as follows :—

Values adopted for Valuation of Live Stock.

Kind of Stock.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.
Horses ..	£8	£15	£4	£7	£20	£20	£5	£8
Cattle ..	£6	£6	£3	£5	£2 10/-	£3	£2	£6
Sheep ..	10/-	12/6	9/-	10/-	8/-	10/-	12/6	10/-
Pigs	£1	£2 10/-	15/-	£2	£2 10/-	15/-	£1 10/-	£1

On the basis of these rates the values obtained for the classes of stock quoted were as follows :—

Valuation of Principal Classes of Australian Live Stock, 1915-16.

Kind of Stock.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
	£	£	£	£	£	£	£	£	£
Horses	5,853,880	7,405,685	2,747,484	1,773,331	3,260,320	828,440	99,785	10,480	21,980,405
Cattle	14,835,786	6,261,624	14,342,679	1,132,825	2,052,620	508,725	967,922	33,996	40,136,177
Sheep ..	16,437,180	6,591,020	7,177,569	1,837,273	1,921,540	812,225	36,142	51,342	34,864,291
Pigs ..	286,478	480,005	88,340	132,474	145,578	28,333	750	289	1,162,247
Total	37,413,324	20,739,334	24,356,072	4,875,903	7,380,058	2,177,723	1104599	96,107	98,143,120

For the Commonwealth as a whole these values average £9 3s. 10d. per head for horses, £4 0s. 3d. per head for cattle, 10s. per head for sheep, and £1 10s. 7d. per head for pigs.

Of the minor classes of live stock, poultry are the most important, but in this case the records are very incomplete. As the result of a census of poultry taken in Victoria in April, 1911, the numbers of fowls, ducks, geese and turkeys were ascertained, and these on the basis of the average market prices for that year were worth £581,766, or 36 per cent. of the average value of the poultry and eggs produced in the State for that year. As an estimate of such annual production is available for each State, it has been assumed that, in each case, the value of the poultry as at 30th June, 1915, was 36 per cent. of the value of the production of poultry and eggs for 1915. On this basis the value obtained for the poultry was as follows :—

Estimated Value of Poultry as at 30th June, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	F.T.	C'wlth.
£	£	£	£	£	£	£	£
771,840	628,920	38,653	186,771	66,370	72,000	720	1,765,274

The other kinds of domestic live stock in Australia are relatively unimportant, and consist mainly of goats, camels, mules and donkeys. For the purposes of the present estimate the values of these have been taken at 10s. per head for goats, £25 per head for camels, £10 per head for mules, and £5 per head for donkeys. On this basis the values for the several States and Territories are as follows :—

Estimated Value of Goats, Camels, Mules and Donkeys, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
£	£	£	£	£	£	£	£	£
75,049	3,264	95,435	134,534	163,161	1,283	10,211	35	482,972

A combination of the foregoing results gives a total for the Commonwealth slightly in excess of a hundred millions sterling, made up as follows, the figures being given to the nearest £1000 :—

Estimated Total Value of Australian Live Stock, 1915-16.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
38,260	21,371	24,490	5,197	7,610	2,251	1,115	97	100,391

The total for the Commonwealth represents an average of £20 5s. 7d. per head of the mean population for 1915.

(iii.) *Agricultural, dairying and pastoral implements and machinery.*—In all the States except Victoria returns are furnished annually shewing separately the value of implements and machinery (i.) used mainly in general agriculture, (ii.) used mainly in dairying, (iii.) used mainly in pastoral pursuits, (iv.) travelling machinery. Figures are also furnished in respect of the Federal Territory annually, and a return for the Northern Territory was supplied for the year 1912.

The figures so available, and the relation of these values (i.) to the area under cultivation, in the case of agricultural and travelling implements and machinery, (ii.) to the number of dairy cattle, in the case of dairying implements and machinery, and (iii.) to the number of sheep, in the case of pastoral implements and machinery, are given in the following table :—

Values of Agricultural, Dairying and Pastoral Implements and Machinery, 1915.

State or Territory.	Agricultural Implements and Machinery.		Dairying Implements and Machinery.		Pastoral Implements and Machinery.		Travelling Machinery.	
	Total Value.	Value per 100 acres under Crop.	Total Value.	Value per 100 head of Dairy Cattle.	Total Value.	Value per 1000 head of Sheep.*	Total Value.	Value per 100 acres under Crop.
	£	£ s. d.	£	£ s. d.	£	£ s. d.	£	£ s. d.
N.S.W. ..	5,357,019	92 8 5	570,871	76 16 6	2,012,539	43 19 9	117,045	2 0 5
Queensland ..	1,531,303	209 17 8	279,258	83 6 0	490,935	9 10 7	45,631	6 5 1
S. Australia	3,010,839	80 0 0	94,260	112 0 1	199,039	40 19 3	14,355	0 7 7
W. Australia	1,789,626	81 14 9	16,985	59 18 7	309,491	27 15 4	53,959	2 9 3
Tasmania ..	317,147	95 2 10	62,703	131 17 11	18,907	7 5 5	79,668	23 18 0
Nor. Territory	3,000	1094 17 9	50	71 8 7	5,000	1 5 6	..	..
Fed. Territory	5,008	114 11 6	84	15 12 10	2,509	17 9 2	..	..
C'wlth, exclusive of Vic.	12013,942	93 14 8	1,024,211	83 0 11	3,038,420	25 6 7	310,658	2 8 6

* For the purposes of this return cattle have been converted into their equivalent in sheep by multiplying by eight.

The travelling machinery shewn in the foregoing table being mainly agricultural, its total value has been shewn in relation to the area under crop. As the conditions in respect of agricultural, dairying and pastoral pursuits in Victoria are probably more closely allied to those in New South Wales than to those in any other State, it has been assumed, for the purpose of estimating the total value for Victoria, that the values per 100 acres, etc., shewn above for New South Wales are applicable to the appropriate data available for Victoria. On this basis the Victorian values for 1915 have been estimated as follows :—Agricultural, £5,278,000 ; dairying, £347,000 ; pastoral, £672,000 ; travelling, £115,000.; total, £6,412,000.

The aggregage for the Commonwealth for 1915 may thus be estimated as follows :—

Estimated Value of Agricultural, Dairying and Pastoral Implements and Machinery, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1 000	£1,000	£1,000
8,057	6,412	2,347	3,319	2,170	478	8	8	22,799

The total for the Commonwealth represents an average of £4 12s. 1d. per head of mean population for 1915.

(iv.) *Manufacturing plant and machinery.*—In all the States returns are collected and tabulated annually in respect of all factories, a factory being defined as an industrial establishment in which four or more persons are employed or in which power other than hand-power is used whatever number of persons are employed. These returns include one relating to the approximate value of plant and machinery employed in such factories, and the figures for 1915 have been used for the purposes of the present estimate. As, however, these figures include the value of plant and machinery to the amount of some £2,237,000, employed in railway and tramway workshops which are mainly Government establishments, a deduction has been made of the whole of the value so shewn in the annual returns. This deduction is probably somewhat in excess for this class of establishment, as some are private concerns, but the excess may be considered as a set-off to the values associated with other Government enterprises of a minor character.

Approximate Value of Manufacturing Plant and Machinery, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
15,901	10,761	6,817	3,225	2,194	1,142	40,040

The total for the Commonwealth represents £8 1s. 9d. per head of the mean population for 1915.

(v.) *Mining Properties.*—A reliable estimate of the value of mining properties in Australia is difficult to obtain. A careful examination of the paid-up capital and the dividends of such companies operating as at 30th June, 1915, disclosed the fact that the paid-up capital as at that date totalled £45,874,366, and that the dividends reported for the year ended 30th June, 1915, was £1,354,805. A similar investigation in respect of the dividends for mines operating at 31st December, 1916, indicated that the total amount of the dividends paid during 1916 was £1,569,253. Writing under date December 1913, Mr. R. L. Nash, in his "Australasian Joint Stock Companies Year-book, 1913-14," gives results for Australasia, which, on the deduction of the figures stated or estimated as applicable to New Zealand, indicate for the Australian mining companies a paid-up capital of about £50,000,000, and an annual dividend of about £3,300,000, but the period to which the data relate is not stated. The figures so given for paid-up capital is only about 10% in excess of that indicated above, but the amount of dividends shewn is much higher, exceeding by nearly 150% the amount computed for the year 1914-15, and by about 110% that computed for 1916. Probably the reduction in the amount of dividends is due in large measure to the dislocating effects of the war. In view of these facts, it has not been deemed advisable to attempt a valuation based on the capitalisation of the dividends. It may be here noted that approximate values of the mining plant and machinery of all the States except Tasmania are furnished annually by their respective Departments of Mines. The figures given for the year 1915 for these States and for the Northern Territory are as follows, an estimate being included for Tasmania based upon returns shewing the number of men employed, and the value of the output for the year :—

Estimated Value of Mining Plant and Machinery, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
6,069	1,597	2,381	750	3,410	850	32	15,089

After reviewing the evidence available, it appeared that for the purposes of the present estimate, the most suitable basis of computation would be one based on the paid-up capital, and that to allow for possible over capitalisation a deduction of say 10% should be made.

On this basis the estimated values for 1915 work out as follows, the figures shewn for the Northern Territory being value of plant and machinery only :—

Estimated Values of Mining Properties, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
10,875	7,551	6,170	1,438	11,311	3,942	32	41,319

The total for the Commonwealth represents an average of £8 7s. per head of the mean population for 1915.

(vi.) *Coin and Bullion.*—The principal supplies of coin and bullion in Australia are (*a*) those held by the banks, (*b*) those held by the Commonwealth Treasury as Australian Note Reserve, (*c*) those held by the Mint, (*d*) those in the hands of the public.

As regards the bank holdings, returns are furnished quarterly by all the cheque-paying banks, shewing for each State and the Northern Territory the average for the quarter of the weekly holdings of coin and bullion. For the purpose of the present return the mean has been taken of the averages for the quarter ended 30th June, 1915, and of that for the quarter ended 30th September, 1915. The figures so obtained represent approximately the position as at 30th June, 1915. In the case of gold this figure may be taken as it stands, but the face-value of silver and copper coinage will require to be reduced by the application of a factor representing the ratio of the bullion value of the coin to its face-value. Returns furnished by the various banks as at 30th June, 1916, indicate that at that date the face-value of the coin held by them was distributed in the following proportions : gold, 95.54% ; silver, 4.31% ; bronze, 0.15%. For the year 1915 the average price per ounce of silver in the London market was $23\frac{11}{16}$d., and as the face-value of silver coin is 5s. 6d. per ounce, the factor for reduction in the case of silver is approximately 0.359. On the basis of the London prices of June, 1915, the metallic value of the bronze coinage was about 9d. per lb. As bronze coins having a face-value of £1 weigh approximately $5\frac{1}{2}$ lbs., on the assumption that the amounts of pence and half-pence in circulation are approximately equal in face value, the appropriate reduction factor in the case of bronze is about 0.206. Taking these factors in conjunction with the proportions of silver and bronze furnished above, it will be seen that the estimated banks' holdings of coin as at 30th June, 1915, must be multiplied by 0.971 to reduce them to their metallic values.

After making the requisite calculations, the results obtained are as follows :—

Estimated Metallic Value of Coin and Bullion held by the Cheque-paying Banks at 30th June, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	C'wlth.
£	£	£	£	£	£	£	£
13,667,081	8,267,795	3,342,470	2,787,474	3,928,046	804,389	7,488	32,804,743

Under the provisions of " The Australian Notes Act, 1910," the Commonwealth Treasurer was required to hold in gold coin (*a*) an amount not less than one-fourth of the amount of Australian Notes issued by the Treasury up to £7,000,000 ; and (*b*) an amount equal to the amount of Australian Notes issued in excess of £7,000,000. By the " Australian Notes Act 1911," this provision was amended, and since 1st July, 1912, the Treasurer has been required to " hold in gold coin a reserve of not less than one-fourth of the amount of Australian Notes issued." The amount so held in accordance with the Act on the last Wednesday in June, 1915, was £11,034,703 10s.

The amount held by the Mint at any given time is relatively unimportant. The accounts for the branches at Sydney, Melbourne, and Perth are made up to 31st December in each year, and shew in the " Bullion Account" the value of the bullion in store at the beginning and end of the year. For the purposes of the present estimate the mean of these for 1915 has been taken as representing approximately the position at the 30th June, 1915.

The figures so obtained for the several branches are as follows :—Sydney, £14,722 ; Melbourne, £2273 ; Perth, £4649.

As regards the value of coin held by the general public, it has been assumed that by the 30th June, 1915, gold had ceased to circulate, its place being taken by Australian notes. This is not strictly correct, as small amounts of gold coin were still in circulation at a later date. Further, there is little doubt that since the outbreak of war there has been a certain amount of hoarding of gold coin. It is probable, however, that the amount omitted by ignoring these items is not large. In the case of silver and bronze coin it was estimated in 1906 by the deputy-master of the Perth branch of the Royal Mint that the amount then in circulation in the Commonwealth had a face value of £1,200,000, or, say, 5s. 11d. per head of population. This amount per capita was applied to the population of the several States and Territories as at 30th June, 1915, and an allowance was made based on the relative amounts of silver and bronze coin held by the banks and the ratios of metallic to face values determined above, the assumption being made that silver and bronze coin in the hands of the public would be in the same proportion as regards face value as was found in the case of such coin held by the banks.

On this basis the values obtained were as follows :—

Estimated Metallic Value of Silver and Bronze Coin held by the Public, 30th June, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
£	£	£	£	£	£	£	£	£
195,417	149,264	72,227	45,793	33,739	20,756	465	271	517,932

Combining these particulars the value and distribution of coin and bullion work out approximately as follows :—

Estimated Metallic Value of Coin and Bullion in Commonwealth, 30th June, 1915.

Particulars.	N.S.W.	Vic.	Q'lnd.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wth.
	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
Held by banks	13,667	8,268	3,342	2,787	3,928	804	8	..	32,804
Treasury note reserve ..	..	11,035	..	..	..	..	..	..	11,035
Held by Mint ..	15	2	..	..	5	..	..	..	22
In hands of public ..	195	149	72	46	34	21	1	..	518
Total ..	13,877	19,454	3,414	2,833	3,967	825	9	..	44,379

The total for the Commonwealth represents an average of £8 19s. 4d. per head of the mean population for 1915.

(vii.) *Private Railways and Tramways.*—In all the States the principal lines of railway are owned and worked by the several Governments, and the majority of the tramways are under the control of either the government of the State or of municipal authorities. There are, however, in addition to the government railways upwards of 3000 miles of privately-owned lines in the Commonwealth, much of which is used solely for special industrial purposes, such, for example, as coal lines in New South Wales, sugar lines in Queensland, and timber lines in Western Australia. Of the private lines used for general traffic, the most extensive are the Midland Railway (177 miles) in Western Australia, the Etheridge Railway (142½ miles), and the Chillagoe Railway (102¾ miles) in Queensland, the Emu Bay Railway (103½ miles) in Tasmania, the Silverton Tramway (36 miles), and the Deniliquin-Moama Railway (45 miles) in New South Wales.

Electric tramways are run by private companies at Ballarat, Bendigo, North Melbourne and Geelong in Victoria, at Brisbane in Queensland, and at Kalgoorlie and Leonora in Western Australia. In the absence of any valuations of the several private lines, the cost of construction has been taken as the value for the purposes of the present return.

Estimated Value of Private Railways and Tramways, 1915.

Particulars.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	C'wlth.
Private Railways—	£1,000	£1,000	£1,000	£1 000	£1,000	£1,000	£1,000
General Traffic ..	1,211	45	1,464	..	2,037	1,163	5,920
Special Purposes ..	250	50	1,667	68	1,375	65	3,475
Private Tramways ..	..	405	1,477	..	458	..	2,340
Total	1,461	500	4,608	68	3,870	1,228	11,735

The total for the Commonwealth represents an average of £2 7s. 5d. per head of the mean population for 1915.

(viii.) *Shipping.*—Particulars in respect of the vessels on the Registers of the Commonwealth are available as at 31st December in each year. A summary of the information so furnished in respect of the number and net tonnage for 1914 and 1915 is given in the following table :—

Vessels on Australian Registers at 31st December, 1914 and 1915.

Particulars.	31st Dec., 1914.			31st Dec., 1915.		
	No.	Net Tonnage.	Average Tonnage per Vessel.	No.	Net Tonnage.	Average Tonnage per Vessel.
Steam—		tons.	tons.		tons.	tons.
Dredges and Tugs ..	135	8,640	64.00	137	8,717	63.63
Other Vessels	1,030	320,465	311.13	1,029	316,059	307.15
Sailing—						
Fitted with auxiliary power	179	3,751	20.96	196	4,156	21.20
Other Vessels	1,167	50,558	43.32	1,141	48,242	42.28
Barges, Hulks, Dredges, etc., (not self-propelled)	286	66,223	231.55	277	68,771	248.27
Total	2,797	449,637	160.76	2,780	445,945	160.41

For the purposes of the present estimate, a request was made to some of the leading shipowners for an approximate value per net ton as at 30th June, 1915, applicable to the vessels on the register. This information was courteously furnished by those applied to, the average values given per net ton being as follows :—Steam Dredges £95, Steam Tugs £300, Other Steam Vessels £32, Sailing Vessels fitted with auxiliary power £27, Other Sailing Vessels £10, Barges, Hulks, Dredges, etc., not self-propelled, £12. On the basis of these averages the value of the shipping on the register was computed, on the assumption that the appropriate number for 30th June, 1915, was the mean between the numbers on the register at 31st December, 1914, and 31st December, 1915. For the purposes of local allocation, the vessels registered in the several States and in the Northern Territory have been treated as domiciled therein.

Estimated Value of Shipping Registered, 30th June, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
4,215	4,844	1,102	2,009	838	316	7	13,331

The total for the Commonwealth represents an average of £2 13s. 10d. per head of the mean population for 1915.

(ix.) *Agricultural and Pastoral Products.*—Whatever the point of time in respect of which an estimate of wealth is being prepared, there will, in any agricultural and pastoral community, always be a proportion of the previous season's production in the hands of the producers and dealers. In addition, there will usually at such a time be a greater or less amount of work performed, seed sown, etc., in respect of the succeeding harvest. In the case of Australia there is also a large value attachable to the wool clip, which is being shorn as at the 30th June in any year. To allow for these several factors, it has been assumed that the value of agricultural and pastoral products in the hands of producers and dealers at 30th June, 1915, plus the value of

work done, etc., for the ensuing season, may be taken at one-half the value of the agricultural production for 1915 plus 90% of the wool clip for that year. The estimate which has been made in (ii.) above in respect of sheep is so low that it must be treated as value "off the shears." No allowance has been made for stocks of tallow, skins, hides, etc., held locally. The value obtained is as follows :—

Estimated Value of Agricultural and Pastoral Products as at 30th June, 1915.

Particulars.	N.S.W.	Vic.	Q'lnd.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth
	£1,000	£1,000	£1.000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
Agricultural ..	11,816	11,706	2,510	5,990	3,155	1,694	2	11	36,884
Pastoral	10,970	3,746	5,471	1,220	755	370	14	35	22,581
Total ..	22,786	15,452	7,981	7,210	3,910	2,064	16	46	59,465

The Commonwealth total represents an average of £12 0s. 3d. per head of the mean population for 1915.

(x.) *Locally Manufactured Products.*—The value of the output of manufacturing establishments is collected and tabulated annually in the several States, and for the year 1915 totalled £169,086,700 for the whole of Australia. Of this, however, the railway and tramway workshops which are largely owned by various Governments are responsible for £6,046,521 in all (see item iv. above). This amount has consequently been deducted to reduce the total to a "private" basis in each State. For the purposes of the present estimate it has been assumed that one-sixth of the year's output would be in the hands of merchants and dealers at 30th June, 1915, and that the same proportion of the year's total would be in the hands of the manufacturers in the form of (*a*) completed articles, (*b*) partly manufactured goods, or (*c*) raw materials. The estimate for the holdings of all parties will thus be as follows :—

Estimated Value of Locally Manufactured Products held at 30th June, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1.000	£1,000	£1,000
21,942	16,546	8,285	4,428	1,766	1,380	54,347

The Commonwealth total represents an average of £10 19s. 7d. per head of the mean population for 1915.

(xi.) *Mining Products* (*other than Gold*).—Many of the products of mining in Australia are in the hands of manufacturers and banks, or are exported at a relatively early date after their extraction. This is particularly the case with gold. Probably the mineral most extensively held after extraction and before manufacture, consumption, export, etc., is coal. In the United States estimate for the year 1912, it was assumed that at 31st December, 1912, a quantity of coal equal to the whole of that mined during 1912 was in hand. Such an estimate would be much too high for Australia. For the purpose of the present estimate, it has been assumed that at 30th June, 1915, no gold was in the hands of the mining companies, and that the value of the other minerals so held was one-sixth of the total production of such minerals for the year 1915. Returns of the quantity and value of all minerals produced are collected and published annually by the Mines Departments of the several States.

The values ascertained in the manner indicated above are as follows :—

Estimated Value of Mineral Stocks (other than Gold), 30th June, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
1,506	57	377	162	56	191	5	2,354

The total for the Commonwealth represents an average of 9s. 6d. per head of the mean population for 1915.

(xii.) *Imported Merchandise.*—During the year ended 30th June, 1915, the total oversea importations of merchandise into Australia were valued at £63,563,781. For the purposes of the present estimate it has been assumed that at 30th June, 1915, the value of such merchandise in bonded warehouses, and in the hands of traders, was one-half of the total value, or in round numbers £31,782,000. Owing to the absence of interstate trade statistics, it is impossible to accurately allocate these importations to their States of ultimate destination. Figures are available shewing the values of oversea merchandise directly delivered in each of the States, but as certain of the States, more particularly New South Wales and Victoria, import extensively for the purpose of subsequent distribution to other States, it is clear that an estimate based on direct importation oversea would misrepresent the ultimate distribution. The total of £31,782,000 mentioned above has consequently been allocated to the several States and Territories on a population basis, the results being as follows :—

Estimated Value of Imported Merchandise on Hand, 30th June, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
11,997	9,159	4,410	2,822	2,070	1,280	28	16	31,782

The Commonwealth total represents an average of £6 8s. 5d. per head of the mean population for 1915.

(xiii.) *Clothing and Personal Adornment.*—Under this head may be included all articles of wearing apparel, watches, jewellery, etc., in the hands of the public. Articles of this nature in bonded warehouses or in the hands of traders have been already accounted for under preceding heads. The item is one of some importance, but unfortunately there are no means readily available for making a reliable estimate of the value involved. It has consequently been assumed that an average of £3 per head of the mean population for 1915 might be taken as a figure which at all events does not exaggerate the position. The result so obtained is as follows :—

Estimated Value of Clothing and Personal Adornment, 30th June, 1915.

N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
5,606	4,280	2,061	1,319	967	598	13	7	14,851

(xiv.) *Furniture and fittings, books, pleasure vehicles, &c.*—Under this head an estimate is given in respect of (i.) household furniture and fittings, (ii.) books, (iii.) motor cars and other vehicles used for purposes of pleasure, (iv.) musical instruments, (v.) sewing machines, (vi.) kitchen utensils, (vii.) fancygoods, etc., etc. As in the case of the preceding item, the materials available for an estimate are meagre. It is evident, however, that the wealth represented by the items coming under this head must be considerable.

The estimate was made in the following manner :—The Census of 3rd April, 1911, furnished the number of dwellings, "private" and "other than private," according to the number of rooms, and according to the rental paid. The numbers were as follows :—

State.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.
Private Dwellings (*a*)	319,766	263,634	121,753	82,108	66,553	38,950	1,194	431
Other than private (*b*)	11,210	9,049	4,083	2,071	2,317	1,075	54	11
Unspecified as to—								
Rooms (*a*) ..	1,340	1,119	486	303	291	382	6	6
Do. (*b*) ..	455	359	342	88	129	23	23	..
Rent (*a*) ..	55,741	41,264	23,179	9,585	17,404	5,757	414	262
Do. (*b*) ..	1,708	1,306	905	295	446	147	34	6
Total Dwellings ..	330,976	272,683	125,836	84,179	68,870	40,025	1,248	442

One estimate was made of the average amount of furniture, etc., necessary for "private" and "other than private" dwellings, according to the number of rooms in the dwelling, and a second estimate was made on the basis of the rental paid. These estimates were applied to the data for each State, and means were taken.[1] It was assumed that the value could on the whole be taken as two-thirds of the value of new furniture. On dividing by the number of houses at the time of the census, and also by the population, the results obtained as indicated were as follows :—

State.	N.S.W	Vic.	Q'land	S.A.	W.A.	Tas.	N.T.	F.T.
Value per house ..£	83.60	78.18	61.16	73.85	58.14	60.13	30.80	61.19
Per head of population £	16.8	16.2	12.7	15.2	14.2	12.6	11.6	15.8
Population*at Census No.	1,647	1,316	606	409	282	191	3.3	1.7
Population* in 1915 No.	1,869	1,427	687	440	322	199	4.4	2.5

* In thousands.

As the number of dwellings in 1915 was not available, the amount per head shewn above was multiplied into the population, giving the following results, viz. :—

Estimated Value of Furniture, etc., as at 30th June, 1915.

N.S.W.	Vic.	Q'land.	S.A	W.A.	Tas.	N.T.	F.T.	C'wlth.
£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
31,392	23,111	8,724	6,681	4,577	2,512	51	39	77,087

1. Simple means except in the case of Western Australia, in which case the weight 2 was allowed to the estimation on the basis of rooms, and the weight 1 to that on the basis of rentals, these weights expressing the relative degrees of confidence which it was believed should be attributed to the result.

The total for the Commonwealth represents an average of £15 11s. 6d. per head of the mean population for 1915, or £74 8s. 9d. per occupied dwelling on the 1911 census average of 4.78 inmates per occupied dwelling.

4. **Aggregate of detailed estimates.**—On combining the detailed estimates given in the preceding section, the total value of private wealth existing in Australia, exclusive of private interests in national and communal property, is found to be approximately 1620 millions sterling, or £327 per head of the mean population of the Commonwealth for 1915. As pointed out in section 2 of the present Chapter, a comparison of this estimate with one based on a wealth census or on probate returns is not satisfactory unless there be added to the inventory estimate an allowance for the local holdings of Commonwealth, State and Municipal securities, all of which are brought to account in the census and probate methods. At the 30th June, 1915, the total amount so held was approximately 140 millions sterling, making with the sum quoted above, a total of 1760 millions as compared with the war census total of 1643 millions, and an estimate on the probate basis of little more than 1000 millions. In view (i.) of the emergency nature of the war census, (ii.) of the evidence of incompleteness furnished by the returns, and (iii.) of the tendency for persons furnishing such returns to suspect taxation, and hence to furnish a conservative estimate, it is probable that the War Census total is an understatement of the position.

It will thus be seen that the result obtained by the inventory method, although much in excess of any previous estimates, is in the main corroborated by the wealth census result. A summary of the values obtained is furnished in the following table :—

Estimate of the Private Wealth of Australia as at 30th June, 1915, Based on the Inventory Method of Estimation.

Class of Property.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	N.T.	F.T.	C'wlth.
	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
(i.) Land and Improvements	472,925	314,611	128,867	93,300	61,812	33,093	660	369	1,105,637
(ii.) Live Stock	38,260	21,371	24,490	5,197	7,610	2,251	1,115	97	100,391
(iii.) Agricultural, Dairying and Pastoral Implements and Machinery ..	8,057	6,412	2,347	3,319	2,170	478	8	8	22,799
(iv.) Manufacturing Plant and Machinery	15,901	10,761	6,817	3,225	2,194	1,142	..	..	40,040
(v.) Mining Properties (including Plant & Machinery)	10,875	7,551	6,170	1,438	11,311	3,942	32	..	41,319
(vi.) Coin and Bullion ..	13,877	19,454	3,414	2,833	3,967	825	9	..	44,379
(vii.) Private Railways and Tramways	1,461	500	4,608	68	3,870	1,228	..	..	11,735
(viii.) Shipping	4,215	4,844	1,102	2,009	838	316	7	..	13,331
(ix.) Agricultural and Pastoral Products	22,786	15,452	7,981	7,210	3,910	2,064	16	46	59,465
(x.) Locally Manufactured Products	21,942	16,546	8,285	4,428	1,766	1,380	..	..	54,347
(xi.) Mining Products (other than Gold)	1,506	57	377	162	56	191	5	..	2,354
(xii.) Imported Merchandise ..	11,997	9,159	4,410	2,822	2,070	1,280	28	16	31,782
(xiii.) Clothing and Personal Adornments	5,606	4,280	2,061	1,319	967	598	13	7	14,851
(xiv.) Furniture and Fittings, Books, Pleasure Vehicles, etc.	31,392	23,111	8,724	6,681	4,577	2,512	51	39	77,087
Total	660,800	454,109	209,653	134,011	107,118	51,300	1,944	582	1,619,517
Mean Population for 1915 (in thousands)	1,868.6	1,426.6	686.9	439.5	322.4	199.3	4.4	2.5	4,950.2
Private Wealth per Head ..	£354	£318	£305	£305	£332	£258	£442	£233	£327

For the sake of avoiding any possible misunderstanding of the significance of the above figures, it may be well to again state here that what they represent is an estimate of the value of all the private material wealth existing in Australia at 30th June, 1915, whether such wealth was owned by Australian residents or not. Property situated outside Australia but owned by Australian residents is not included, and immaterial wealth such as title deeds, mortgage deeds, debentures, etc., is not, as such, included at all, the estimate being based entirely on the material private wealth itself, not in any way upon the individual titles thereto. National wealth in the sense of the property of Commonwealth and State Governments, and communal wealth in the sense of the property of the various local governing bodies, are not included, nor has any allowance been made for the fact that private investors are to a very large extent monetarily interested in such property in consequence of advances made by them by way of public and municipal loans. An estimate of the value of national and communal property has not, on the present occasion, been undertaken. One of the large items is the Government Railways and Tramways, and the Municipal Tramways, whose cost of construction and equipment to 30th June, 1915, was about £200,000,000. These, together with public buildings and their sites, State and municipal industrial undertakings, and some other branches of national and communal property, are of course capable of approximate valuation, but there are in addition such items as (i.) unalienated crown lands, (ii.) streets, roads and bridges, (iii.) harbours, etc., for which it would be difficult to devise a suitable valuation basis.

CHAPTER II.—EARLIER AUSTRALIAN INVENTORY ESTIMATES.

1. **Estimate for 1890 and earlier years.**—The earliest estimate of this nature made in respect of Australia appears to be that made in 1892 by Mr. (now Sir) T. A. Coghlan, who, at the time, was Government Statistician of the State of New South Wales. Particulars of this estimate were embodied in a paper read before the Australasian Association for the Advancement of Science at its Hobart session in 1892, and were subsequently published in the 1892 issue of Coghlan's "Seven Colonies of Australasia." The estimate relates not only to Australia, but includes figures for New Zealand, and also furnishes aggregates but not details in respect of Australasia for 1813, 1838, and 1863. As the settlement of New Zealand in a permanent manner dates from 1840, the figures for 1813 and 1838 are necessarily purely Australian, while for 1890 the estimate for New Zealand is shewn in detail. In the case of 1863, however, the only figures furnished are those relating to "Australasia." For the purpose of comparing the Australian figures for the several years mentioned, it has been assumed here that in the estimate for 1863 the private wealth per head of population was the same in New Zealand as in Australia. With this adjustment Coghlan's estimate of private wealth in Australia for the years in question may be stated as follows, the average amount per head of mean population being also shewn:

Coghlan's Estimate of Australian Private Wealth, 1813 to 1890.

Year.	1813.	1838.	1863.	1890.
Aggregate amount ..	£1,000,000	£26,000,000	£160,000,000*	£1,019,242,000
Mean Population ..	13,293	143,178	1,233,106	3,106,917
Average per head of Mean Population ..	£75	£182	£130	£328

* Adjusted. See preceding paragraph.

In later issues of "The Seven Colonies of Australasia," the figures for 1890 have been omitted, and an estimate for 1888 has been substituted, presumably with the object of making equal intervals of 25 years between the successive estimates. The figures, however, are given for "Australasia," not for the Commonwealth and New Zealand separately. The total shewn is £1,015,000,000, or £154,434,000 less than the "Australasian" total for 1890. Assuming this rate of reduction to have applied equally to Australia and New Zealand, the Commonwealth figure for 1888 would work out at about £885,000,000, or £302 per head of mean population.

The following table shews the estimate under eight classes of private wealth for Australia as a whole, particulars having been added shewing the relative size of each class, and the amount per head of mean population :—

Coghlan's Estimate of Private Wealth in Australia in 1890.

Classification of Wealth.	Aggregate Amount.	Percentage on Total.	Average Amount per Head of Mean Population.
	£	%	£ s. d.
Land, Houses & Permanent Improvements	721,303,000	70.77	232 3 2
Live Stock	102,952,000	10.10	33 2 9
Coin and Bullion	28,809,000	2.82	9 5 5
Merchandise	44,722,000	4.39	14 7 11
Household Furniture & Personal Property	52,863,000	5.19	17 0 3
Shipping	5,210,000	.51	1 13 7
Mines and Mining Plant	33,823,000	3.32	10 17 9
Plant Employed in Agricultural, Manufacturing and other Industries not elsewhere included	29,560,000	2.90	9 10 3
Total	1,019,242,000	100.00	328 1 1

2. **Estimates for 1903 and earlier years.**—Further estimates of the private wealth of Australasia were prepared by Coghlan in respect of the years, 1899, 1901 and 1903, and published in his "Seven Colonies of Australasia," and his "Statistical Account of Australia and New Zealand." The particulars in respect of the method of estimating are less complete than is the case with the estimate for 1890, but evidently they were made upon principles very similar in character. For the purposes of the present review it will be sufficient to consider in detail the latest of these, viz., that for 1903. The classes of wealth adopted differ slightly from those used in the 1890 estimate, the main alteration being the separation of "Land" from "Houses and Permanent Improvements," and the separation of "Personal Effects" from "Furniture and Household Goods and Effects," thus increasing the number of classes to ten in place of the eight classes used in the estimate for 1890. The other classes were in some

instances slightly altered in title, but were apparently little changed otherwise. The aggregate obtained for the Commonwealth is that shewn in the succeeding table, columns having been added to shew relative distribution and values per head :—

Coghlan's Estimate of Private Wealth in Australia for 1903.

Classification of Wealth.	Aggregate Amount.	Percentage on Total.	Average Amount per Head of Mean Population.
	£	%	£ s. d.
Land	373,679,000	38.04	95 19 7
Houses and Permanent Improvements	310,265,000	31.60	79 13 10
Live Stock	96,915,000	9.86	24 17 10
Furniture & Household Goods & Effects	30,899,000	3.15	7 18 9
Personal Effects	12,464,000	1.27	3 4 0
Machinery and Implements of Trade (excluding Mining Machinery)	33,495,000	3.45	8 12 1
Shipping	6,359,000	.65	1 12 8
Mining Properties and Plant	32,199,000	3.27	8 5 5
Merchandise and Produce on Hand	59,640,000	6.06	15 6 4
Coin and Bullion	26,064,000	2.65	6 13 11
Total	981,979,000	100.00	252 4 5

CHAPTER III.—COMPARISON OF EARLIER ESTIMATES WITH THOSE FOR 1915.

1. **Aggregate amounts.**—For the purpose of comparing the estimates made in respect of the years 1890, 1903 and 1915, the following table, based on the classification adopted in 1890, has been prepared :—

Comparison of Estimates for 1890, 1903, 1915.

Classification of Wealth.	Aggregate Amount of Private Wealth.			Increase (+) or Decrease (—)		
	1890. (Coghlan)	1903. (Coghlan)	1915. (Knibbs)	1890 to 1903.	1903 to 1915.	1890 to 1915.
	£1,000	£1,000	£1,000	£1,000	£1,000	£1,000
Land, Houses and Permanent Improvements	721,303	683,944	1,105,637	—37,359	+421,693	+384,334
Live Stock	102,952	96,915	100,391	— 6,037	+ 3,476	— 2,561
Coin and Bullion	28,809	26,064	44,379	— 2,745	+18,315	+ 15,570
Merchandise and Produce on Hand	44,722	59,640	147,948	+14,918	+88,308	+103,226
Household Furniture and Personal Property	52,863	43,363	91,938	— 9,500	+48,575	+ 39,075
Shipping	5,210	6,359	13,331	+ 1,149	+ 6,972	+ 8,121
Mines and Mining Plant	33,823	32,199	41,319	— 1,624	+ 9,120	+ 7,496
Plant, Machinery, etc., not elsewhere included	29,560	33,495	74,574	+ 3,935	+41,079	+ 45,014
Total	1,019,242	981,979	1,619,517	—37,263	+637,538	+600,275

With the exception of three items, viz., (*a*) Merchandise, etc., (*b*) Shipping, and (*c*) Plant, Machinery, etc., the aggregate estimates for 1903 fell short of the corresponding items for 1890, the principal shortage being a decline of £37,359,000 in the estimated value of "land, houses and permanent improvements." For all classes of wealth combined the estimate for 1903 fell short of that for 1890 by £37,263,000.

On the other hand the estimate for 1915 shews in every item a substantial advance on that for 1903. The largest increase is that of £421,693,000 in the value of "land, houses and permanent improvements," while for all classes of wealth an advance of £637,538,000 is shewn.

Comparing the estimate for 1915 with that for 1890 there is in evidence an increase in every item except that of live stock, the total increase shewn for the 25 years being £600,275,000.

As a partial explanation of the decline in estimated values between 1890 and 1903, it may be pointed out that the year 1890 occurred near the apex of a period of exceptional and to some extent perhaps fictitious prosperity, and that in consequence prices, and especially the prices of real estate, were in an inflated condition. The subsequent collapse, followed and accentuated by the banking crisis of 1893, and supplemented by a series of unfavourable seasons, produced a condition of depression which was only slightly relieved by the discovery and development of the Western Australian Goldfields during the years 1893-1897. The outcome was that the prices of commodities fell rapidly, and the fall in the prices of real estate was even more marked. A further unfavourable influence in the case of 1903 was the fact that in the season 1902-3 Australia experienced one of its most severe droughts.

In the case of 1915 it should be noted that since 1896 there has been a fairly continuous upward trend in the world's prices for practically all commodities, accompanied in Australia by a marked recovery in the values of real estate. This rise in the prices of commodities has been very marked since 1905, and has in recent years been accentuated by the outbreak of war in 1914.

2. **Relative distribution of private wealth according to class.**—The following table furnishes a comparison of the relative distribution of wealth according to class for the estimates made in respect of 1890, 1903 and 1915 :—

Relative Distribution of Private Wealth, 1890, 1903 and 1915.

Classification of Wealth.	Percentage on Estimated Total.			Increase (+) or Decrease (−) in Proportion per cent.		
	1890. Coghlan	1903. Coghlan	1915. Knibbs	1890 to 1903.	1903 to 1915.	1890 to 1915.
	%	%	%	%	%	%
Land, Houses and Permanent Improvements	70.77	69.64	68.27	—1.13	—1.37	—2.50
Live Stock	10.10	9.86	6.20	—0.24	—3.66	—3.90
Coin and Bullion ..	2.82	2.65	2.74	—0.17	+0.09	—0.08
Merchandise and Produce on Hand	4.39	6.06	9.14	+1.67	+3.08	+4.75
Household Furniture and Personal Property ..	5.19	4.42	5.68	—0.77	+1.26	+0.49
Shipping	0.51	0.65	0.82	+0.14	+0.17	+0.31
Mines & Mining Plant	3.32	3.27	2.55	—0.05	—0.72	—0.77
Plant, Machinery, etc., not elsewhere included	2.90	3.45	4.60	+0.55	+1.15	+1.70
Total	100.00	100.00	100.00	..	..	..

An interesting feature of this comparison is the very high proportion in each case which is represented by property in the form of "land, houses, and permanent improvements," ranging from 70.77 per cent. in the 1890 estimate, to 68.27 per cent. in that for 1915.

Three of the items, viz., (i.) land, etc., (ii.) live stock, and (iii.) mining properties, occupied positions of diminishing relative importance at the successive estimates. On the other hand, three items, viz., (i.) merchandise, etc., (ii.) shipping, and (iii.) plant, machinery, etc., occupied positions of increasing relative importance. In the case of the two remaining items, viz., (i.) coin and bullion, and (ii.) household furniture, etc., the estimates indicated an initial decrease, and subsequent increase in relative importance, the variation in the case of coin and bullion being very small. In the main it may be said that the figures indicate a decline in the relative importance of the primary sources of wealth, and an increase in the relative importance of the accumulated products of industry in the shape either of goods available for consumption or of mechanical and other aids to production.

With the exception, however, of the relative increases in the items "merchandise, etc.," and "plant, etc.," and the relative decreases in the item "live stock," the variations were not very marked.

3. **Private wealth per head in each class.**—Another comparison of importance in this matter is the amount per head of mean population for the years in question, represented by the several items. This is furnished in the succeeding table :—

Private Wealth per Head of Mean Population, 1890, 1903 and 1915.

Classification of Wealth.	Average Wealth per Head.			Increase (+) or Decrease (−) in Average Wealth per Head.		
	1890. (Coghlan)	1903. (Coghlan)	1915. (Knibbs)	1890 to 1903.	1903 to 1915.	1890 to 1915.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Land, Houses, and Permanent Improvements ..	232 3 2	175 13 5	223 7 0	−56 9 9	+47 13 7	− 8 16 2
Live Stock	33 2 9	24 17 10	20 5 7	− 8 4 11	− 4 12 3	−12 17 2
Coin and Bullion	9 5 5	6 13 11	8 19 4	− 2 11 6	+ 2 5 5	− 0 6 1
Merchandise and Produce on Hand	14 7 11	15 6 4	29 17 9	+ 0 18 5	+14 11 5	+15 9 10
Household Furniture and Personal Property ..	17 0 3	11 2 9	18 11 6	− 5 17 6	+ 7 8 9	+ 1 11 3
Shipping	1 13 7	1 12 8	2 13 10	− 0 0 11	+ 1 1 2	+ 1 0 3
Mines and Mining Plant	10 17 9	8 5 5	8 7 0	− 2 12 4	+ 0 1 7	− 2 10 9
Plant, Machinery, etc., not elsewhere included ..	9 10 3	8 12 1	15 1 3	− 0 18 2	+ 6 9 2	+ 5 11 0
Total	328 1 1	252 4 5	327 3 3	−75 16 8	+74 18 10	− 0 17 10

In all the items except that of "merchandise, etc.," the estimate per head for 1903 is below that for 1890, the most extensive decline being in the case of "houses, etc." "Live stock," "coin and bullion," "household furniture, etc.," and "mines," also shew substantial shortages, the total per head for 1903 falling short of the 1890 estimate by £75 16s. 8d.

On the other hand the 1915 estimate per head exhibits advances on that for 1903 in all the items except live stock, the total per head giving an advance of £74 18s. 10d.

Compared with the estimate per head for 1890, that for 1915 shews decreases in four items, viz., "land, etc.," "live stock," "coin and bullion," and "mines," while it exhibits increases in the other four items. For a reference to the causes tending to produce these fluctuations see p. 157.

CHAPTER IV.—ESTIMATES OF THE NATIONAL WEALTH OF THE UNITED STATES OF AMERICA.

1. **General.**—The following particulars exhibiting the methods and the results of estimates of the wealth of the United States of America have, in the main, been taken from the publications of the Bureau of the Census, Washington, D.C.

2. **Census of 1850.**—The first effort of the Government to obtain a statement of the valuation of the property of the country was made under the Census Act of 1850. The instructions on the schedules issued to United States marshals, through whom the census statistics for that year were collected, required those officers to obtain statistics of the valuation of real and personal property as assessed for taxation, *and in addition thereto the true valuation of such property.* For obtaining this latter, the schedules contained the following instructions :—

> "The *true valuation* of all property should be estimated at what is its cash value in the place where it is situated. In some places, however, it is valued by appraisers at two-thirds or one-half of its just value, and the assessment made upon such valuation. If in the estimate of an estate it is valued at other than its true worth, the true valuation should be stated, which may easily be done by adding the proper per centum to the recorded valuation."

No valuation statistics of the above character were published in the final report of the Census of 1850, but a preliminary report by the Superintendent, which was published as a Congress Paper, contained a table of such values under the heading "real and personal estate," with the following remark :—

> "The table of real and personal estate owned by individuals is made up from official returns of property for taxation. Where the assessment has been made on a sum less than the intrinsic worth, the assistant marshals were instructed to add the necessary percentage. For the purposes of taxation the full amount is not generally given, in rural districts especially. Stocks or bonds owned by the States or by the General Government are not represented. The value of slaves is included."

The table mentioned is headed "valuation of real and personal estate of the inhabitants of the United States for the year ending 1st June, 1850," and the total true or estimated value is given as $7,135,780,228 (= £1,466,000,000 approximately, *i.e.*, on the basis of $4.86\frac{2}{3}$ to the £).

3. **Census of 1860.**—At the Census of 1860 the marshals of the United States were directed to obtain from the records of the States and Territories respectively, an account of the value of real and personal estates as assessed for taxation. Instructions were given these officers to add the proper amounts to the assessment, so that the return should shew the true value *as well as the inadequate sum generally attached to the property for taxation purposes.* The aggregation of these returns indicated that the value of individual property in the States and Territories amounted to $16,159,616,068 (= £3,320,000,000 approximately, at $4.86\frac{2}{3}$ to the £).

In the returns for 1850 and 1860 the value of all taxable property was returned, including that of foreigners and non-residents, as well as that of natives and residents, while all property belonging to the State or Federal Government was excluded.

4. **Census of 1870.**—In 1870 the duty of ascertaining the assessed and true valuation of property was again entrusted to the United States marshals. The points particularly dwelt upon in the instructions from the Census Office were :—

(i.) the undervaluation of real estate in assessments for taxation ;

(ii.) the large class of personal property lawfully exempt from taxation ;

(iii.) the class disregarded by assessors ;

(iv.) the class which by evasion or fraud escapes taxation.

In the report dealing with this census, it is stated that " for the majority of the States and for the vast majority of the property of the country, *the additions to be made to assessed values on account of the undervaluation of real estate has been calculated with great nicety by competent investigators.*" The report admits, however, that no such accurate methods could be applied to make good the shortages due to exemptions or escape of personal property from taxation in 1870, and states that the result reached must be characterised rather as an impression than an opinion. The estimated true value of all taxable property was given for 1870 on a gold basis as \$24,054,814,806 (= £4,940,000,000 approx., at \$4.86⅔ to the £).

5. **Census of 1880.**—At the Census of 1880 a special effort was made to introduce an initial correction into the statistics of the assessed valuation of real estate. With this object a circular letter was addressed from the Census Office to a very large number of bankers, real estate agents, and business men, as well as public officials connected more or less directly with the valuation of property for the purposes of taxation. The letter enclosed a form of report drafted for the purpose of obtaining an explicit statement of the methods of procedure adopted in the various localities in connection with the valuation of real estate. The main object of the inquiry was that of ascertaining for the different classes of real estate the percentage of assessed value to real value in the different localities.

Over 25,000 replies to the circular were received, the majority of them exhibiting both a disposition to assist, and also a fair comprehension of the purpose of the inquiry.

From an analysis of the data so obtained, it was ascertained that the ratios of assessed to true valuation of real estate ranged from 40 to 100 per cent., with an average for the country as a whole of 65 per cent. The percentage was in general found to be highest in those States having a large urban population, and least in the rapidly-growing States of the Upper Mississippi Valley.

On previous occasions the estimates had related to taxable property only, but at the Census of 1880, and those taken subsequently, an estimate was also made of the value of property exempt from taxation, consisting mainly of the property of Federal, State and Local Governments, and of religious, charitable and educational institutions.

In the reports dealing with the censuses subsequent to that of 1880, the estimated values of taxable and exempt property are shewn separately, but in that of the 1880 Census the figures given relate to taxable and exempt property combined. In 1890 the estimate for exempt property represented 5.9% of the combined total, the corresponding percentage in 1900 being 7, while in 1904 it was 6.4%, and in 1912, 6.6%. The combined total value for taxable and exempt property ascertained at the Census of 1880 was \$43,642,000,000 (= £8,968,000,000 at \$4.86⅔ to the £).

6. **Census of 1890.**—At the Census of 1890 inquiries were sent to county and municipal officers asking them to state what, in their opinion, was the relation between the assessed and the true value of the real estate as respectively assessed by them. To corroborate the reports furnished by these officers, upwards of 25,000 inquiries were sent throughout the country to persons believed to be familiar with the values of real estate, asking their opinion as to the relation between the assessed and true value in their respective localities. The replies received were considered in connection with the reports of the assessors. The value of farm lands as reported by the census enumerators was also taken into consideration.

The estimated value of property for the Census of 1890 was $65,037,091,197, comprising taxable property $61,203,755,972, and exempt property $3,833,335,225. Again, taking $4.86⅔ to the £, these may be represented approximately by taxable property £12,577,000,000, and exempt property £788,000,000, giving a combined total of £13,365,000,000.

7. **Census of 1900.**—(i.) *General.*—The volume relative to wealth, debt and taxation issued by the Bureau of the Census, Washington, in connection with the Census of 1900, contains the results of two estimates of wealth, one in respect of the year 1900, the other in respect of the year 1904. The former of these was authorised by the Act of 3rd March, 1899, providing for the Twelfth Census, the latter by the Act of 6th March, 1902, establishing the permanent Census Office. In both cases the particulars published relate to continental United States, that is, they are exclusive of Alaska, Hawaii, Porto Rico, and the Philippines.

(ii.) *Farm and Factory Property.*—For the year 1900 Congress specifically authorised and directed that the value of property employed in agriculture and manufactures as appraised by owners, occupiers or managers thereof should be ascertained through the agency of census enumerators. The values so determined for this class of property are shewn in the following table :—

Estimated Value of Farm and Factory Property, U.S.A., 1900.

	$	£1,000,000
Farm Property—		
Land and Improvements (other than Buildings)	13,058,007,995	= 2,683
Buildings	3,556,639,496	= 731
Live Stock	3,075,477,703	= 632
Implements and Machinery	749,775,970	= 154
Factory Property—		
Land	1,027,368,280	= 211
Buildings	1,449,403,782	= 298
Machinery, Tools and Implements	2,541,046,639	= 522
Total Farm and Factory	25,457,719,865	= 5,231

The conversion in this table from American to British currency has been made on the basis of $4.86⅔ to the £.

The farm and factory total, however, constituted but a small part of the tangible wealth of the United States, and represented less than 29 per cent. of the total estimated wealth of all kinds for 1900.

(iii.) *Taxable Real Property.*—For the value of property other than that connected with farms and factories, estimates of various kinds were employed. The most important single class of property outside those mentioned above was taxable property used for residential and business purposes, and for mines and quarries.

No *complete* appraisal of taxed real property had ever been made in the United States except by assessors for purposes of taxation, and as the Census Act did not authorise the collection by census enumerators of such information for property other than that connected with farms and factories, the lists prepared by the taxation assessors were used as the basis for estimating the other kinds of real estate. For the purposes of this estimate an endeavour was made to ascertain the percentage of true value represented in each case by the assessed valuation, and the Bureau of the Census sought to utilise all the available information relating to the subject. The means adopted comprised (i.) the comparison of farm values collected by the census enumerators with assessed values for the same properties; (ii.) the comparison of selling prices with assessed values; (iii.) inquiries made by agents of the Bureau of the Census in practically all cities, villages and county seats from persons competent to give information relating to the ratio between the assessed valuation and the true value of real property; (iv.) reports of such ratios given in financial publications; (v.) reports of State tax commissions and State equalisation boards.

(iv.) *Exempt Real Property.*—In estimating the value of real property exempt from taxation, great difficulty was experienced in all cases except New York, Massachusetts, New Jersey, and Pennsylvania.

In the majority of cases the estimates of the value of exempt real property were prepared by using information secured from a number of sources, comprising amongst others :—(i.) Special inquiries by census agents; (ii.) special returns supplied by city authorities; (iii.) special returns from churches, schools and kindred institutions; (iv.) a uniform rate of \$1.25 (=5s. 2½d.) per acre assigned to the unappropriated and reserved domain of the United States outside of Indian Territory and Oklahoma; (v.) in the two Territories mentioned a value equal to that assigned by farmers who, as lessees, used it for agricultural purposes.

(v.) *Live Stock.*—On 1st June, 1900, the census enumerators recorded the number and value of the various classes of domestic stock on farms, and the value of poultry and bees on farms. They also recorded the number, but not the value, of domestic stock not on farms. These latter were valued on the assumption that the average value of each class of stock was the same as that ascertained for farms. Poultry and bees not on farms were not recorded.

(vi.) *Farm Implements and Machinery.*—The figures given under this head for 1900 are those reported by the census enumerators in respect of farm implements and machinery on farms at 1st June, 1900.

(vii.) *Manufacturing Machinery, Tools, and Implements.*—The values of manufacturing machinery, tools, and implements for 1900 were reported by the Census of Manufactures for that year. The census was practically for the calendar year 1899, and the value returned for manufacturing machinery, tools, and implements is therefore the value at the close of that year, or about 1st January, 1900, not 1st June, 1900. No allowance for this fact was made in the final table, which consequently, owing to increases between 1st January and 1st June, tends to underestimate the value.

(viii.) *Gold and Silver Coin and Bullion.*—The estimate used for these was based upon the reports of the Director of the Mint, and of the Comptroller of the Currency for the year 1900.

(ix.) *Railroads and their Equipment.*—An extensive valuation of the railroads and their equipment was made for the year 1904 by capitalising the net earnings of individual railways and railway systems. To obtain figures for 1900, computations were made to ascertain approximately the increase from 1900 to 1904, and the figures for 1904 were reduced in accordance therewith.

(x.) *Street Railways, etc.*—The value of street railways was obtained by methods substantially the same as those adopted for estimating the commercial value of railroads, and the same is true in a general way of the estimated value of telegraph and telephone systems. The value of canals was assumed to be the same as that reported at the Census of 1890. The value of shipping was obtained by multiplying the tonnage afloat by the building cost per ton as reported by the 1900 Census of Manufactures, and deducting one-third for depreciation. To this was added the reported cost of the ships of the United States Navy in active commission.

The values of electric light and power stations are based upon the cost of construction as estimated for the year 1902, with a deduction of twice the cost of new construction during 1902.

As privately-owned gas-works had already been included with factories, no special estimates were made for them.

(xi.) *Products of Agriculture, Manufactures, and Mining.*—The value assigned to agricultural products was one-half the value of the crops reported by the Census of Agriculture as raised in the year 1899 (being the quantity estimated as still in hand at 1st June, 1900), plus the value of the labour which had been expended to 1st June, 1900, on the crops of that year, and which was included in the value of the growing crops at that date.

The value of the products of manufactures was based wholly on the report of the 1900 Census of Manufactures. For the value of materials and products in the possession of the factories, an amount was (apparently arbitrarily) allowed equal to two months' "gross products" of 1900. For the manufactured goods in the possession of merchants, an amount was allowed equal to one-half the annual "net products" of the factory output, exclusive of hand trades.

The value of the products of mines and quarries was based upon the census report for mines and quarries for 1902, taken in conjunction with the reports of Geological Survey for the years 1900 and 1902.

In the case of imported merchandise it was assumed that the value of the imports either in bonded warehouses or in the hands of traders on 1st June, 1900, was equal to one-half the value of all such goods imported into the United States during the year ended 30th June, 1900.

(xii.) *Clothing, Furniture and Kindred Personal Property.*—The estimated value of clothing and personal adornments, including watches, jewellery, etc., consisted substantially of the amounts which, on the basis of the 1900 Census of Manufactures and the import returns for 1900, it was estimated that the people of the country expended for clothing and personal adornment for that year. An addition of one-third was made to allow for the increase in value due to the cost of transportation and for the profit of the middleman. A small further addition was made to allow for the value of the work in homes in converting cloth into clothing.

In estimating the value of such articles as furniture for houses and public buildings, books in libraries, carriages, bicycles, automobiles, harness, saddles and all kindred articles other than clothing, it was loosely estimated that the value of all these articles in the possession of the people or in public buildings was equal to four years' purchases of the same articles. The probable cost of four years' purchases was then estimated from the value of the manufactured products and imports which entered into the aggregate, one-third being added for the middleman's profits. In this connection the following account of the method adopted for valuing the corresponding items at the Census of 1880 is of interest. It is taken from the report on that census :—

"The number of families in each State was taken, and these were distributed, according to the statistics of occupation, into certain characteristic classes. The average value of the household goods in the families of each class was then estimated as thoughtfully as possible, item by item, the values given to the goods representing what they were worth to the owner, or what it would cost to replace them, with fair allowance for wear and tear; not what they would be worth to sell as second-hand goods. These results, secondly, were checked by an independent computation, in which the annual product or importation of each class of household goods, furniture, clothing, watches and jewellery, pianos, sewing machines, etc., was taken into account, and an average life in use assigned to the goods of each class. The result of this second and wholly independent computation was to afford a somewhat striking corroboration of the conclusion reached by the first method. Allowance was then made on account of the average quantity of food, fuel and other supplies on hand for domestic use."

In the report of the Census of 1890, the corresponding estimate on that occasion is stated to have been made as follows:—

"Of the miscellaneous, the value of furniture and personal belongings constitutes a large portion. To arrive at the value of such property an examination was made of more than 8000 insurance policies on contents of houses not located in large cities, and the result shewed the average value of furniture insured in such houses to be $387. The value of private carriages and tools of mechanics is not known, but it is believed that for each house in the United States there would be of furniture, tools, and carriages an average amount of $400."

(xiii.) *Aggregate for* 1900.—The total estimated value for 1900 was $88,517,306,775 (= £18,188,000,000 approx., at $4.86\frac{2}{3}$ to the £). The sterling values of detailed items for 1900 will be found in the table on page 167 in conjunction with corresponding figures for 1904 and 1912.

8. **Estimate for 1904.**—In preparing an estimate of the national wealth of the United States of America for 1904, the Bureau of the Census followed as far as possible the same procedure as was followed in the case of the estimate for 1900. The census returns in respect of farm property, which were used in the 1900 estimate were, however, lacking in the estimate for 1904, except in respect of the State of Iowa, for which a census of agriculture was available for 1905. For this State an estimate for 1904 was prepared on the assumption that four-fifths of the increase recorded between 1900 and 1905 had accrued by 1904. A similar assumption was made in respect of manufacturing machinery, tools, and implements, a Census of Manufactures for the whole of the United States, having been taken in 1905. The total value of the national wealth recorded for 1904 was $107,104,211,917 (= £22,008,000,000, at $4.86\frac{2}{3}$ to the £).

The sterling values of detailed items for 1904 will be found in the table on page 167 in conjunction with corresponding figures for 1900 and 1912.

9. **Estimate for 1912.** (i.) *General.*—Particulars concerning the wealth estimate for 1912 have been taken from the Bulletin of Estimated Valuation of National Wealth, issued by the Bureau of the Census, Washington, D.C., on 10th March, 1915.

(ii.) *Taxable real property and improvements.*—The "true" value of such real property was ascertained by obtaining for each of the States an estimate of the ratio of true value to assessed valuation, and by applying these ratios to the aggregate assessments of the several local authorities. The data obtained indicated that the percentage of assessed valuation of real property and improvements on the true value varied for the year 1912 from 11.7% for Iowa, and 15% for Nebraska, to 100% for New Hampshire and Wyoming.

(iii.) *Exempt real property and improvements.*—For an estimate of the value of exempt property it was assumed that on the average such property amounted to one-eighth of the value of the taxed real property and improvements. This proportion was based on an examination of the returns for the States of New Jersey, New York and Ohio, and the District of Columbia, which were the only official returns shewing the valuations of exempt property.

(iv.) *Live stock.*—The valuations of the principal classes of domestic animals on farms were taken from the Year Book of the Department of Agriculture for 1912, which gives the estimated value as at 1st January, 1913. The values of other classes of live stock on farms, domestic animals not on farms, and poultry and bees were based upon the Census report for 1909, with an allowance for increased value from 1909 to 1912, based on the annual increase from 1899 to 1909.

(v.) *Farm implements and machinery.*—The estimates for 1912 were prepared by adding to the values reported in the Census of Manufactures for 1909, a value based on the average annual rate of increase from 1899 to 1909.

(vi.) *Manufacturing machinery, tools, and implements.*—The value of manufacturing machinery, tools, and implements was not separately shewn in the returns for the Census of 1909, but was included with other capital. In obtaining an estimate for these items for 1912 it was assumed that they represented the same proportion of the total manufacturing capital as was ascertained for 1904. The estimated value of *capital* in 1912, including machinery, etc., was obtained by applying the annual rate of increase from 1904 to 1909.

(vii.) *Gold and silver coin and bullion.*—The value of gold and silver coin and bullion for 1912 was obtained by deducting from the total figures of the Director of the Mint, the amounts held by the banks in Alaska, Hawaii, Porto Rico, and the Philippine Islands.

(viii.) *Railroads and their equipments.*—The valuation for 1912 was obtained from a report of the Interstate Commerce Commission, which shewed the total valuation of road and equipment for all railroads in the United States. From this total a reserve for depreciation of certain of the railroads was deducted.

(ix.) *Street railways.*—The estimated value of street railways was based upon the cost of construction.

(x.) *Telegraph systems.*—The estimate for telegraph systems, which was based upon cost of construction, includes land telegraph systems, ocean cable telegraph systems, and wireless telegraph systems. The value of wireless systems was reported in 1912 to be $1,205,770 (= £248,000). No valuation for wireless systems was included in previous wealth estimates.

(xi.) *Telephone systems.*—The estimate for telephone systems was based upon the cost of construction.

(xii.) *Pullman and other cars not owned by railroads.*—The estimate of the value of these cars was based on returns furnished to the Interstate Commerce Commission.

(xiii.) *Shipping and canals.*—The estimate for mercantile shipping was based upon a special investigation made by the Bureau of the Census for 1906. The figures so obtained were brought up to date by allowances for the value of ships constructed from 1906 to 1912, based on the Census of Manufactures of 1904 and 1909, and by deductions for the value of shipping lost, etc., based on the report of the Bureau of Navigation for the period 1907 to 1912.

The vessels of the United States Navy in active commission, light vessels and tenders of the Lighthouse Service, vessels of the Revenue-Cutter Service, and the floating equipment of the War Department were added at cost.

The valuation of canals used for commercial purposes, or leased to railroads, was obtained from various sources. The figures for State and corporation canals were taken largely from various State reports, and those Federal Government canals and canalized rivers from reports of the Chief Engineer of the United States Army.

(xiv.) *Irrigation enterprises.*—These are situated in the Western States, and were not included in estimates of wealth for 1900 and 1904.

(xv.) *Privately-owned waterworks.*—The value assigned to these works for 1912 was that of 1900, with a small increase.

(xvi.) *Privately-owned central electric light and power systems.*—The estimated value of these works was based upon the cost of construction.

(xvii.) *Privately-owned gas systems.*—The estimated value of these works was not separately shewn, as it has already been included in the returns of the Census of Manufactures.

(xviii.) *Agricultural products.*—The valuation of the principal classes of agricultural crops was taken from the Year Book of the Department of Agriculture for the year 1912. The valuation of other agricultural crops was taken from the Census report of 1909, with an allowance for the increase from 1909 to 1912. The value of agricultural products in the possession of farmers and traders at the 31st December, 1912, was estimated to be 90% of the value of the crops of that year.

(xix.) *Manufactured products.*—The value of manufactures in 1912 was estimated by adding to the value in 1909 an increase based on that experienced between 1904 and 1909. The value of exports of principal domestic manufactures was deducted to obtain value for domestic use. It was then assumed that one-twelfth of the value of foodstuffs and one-half of the value of other products for domestic use were in the possession of merchants, and that the value of materials and products in the hands of factories was one-sixth of the gross products for 1912.

(xx.) *Imported merchandise.*—The value of imported merchandise in bonded warehouses and in the hands of traders was assumed to be one-half of the value of all such goods imported during 1912 into the United States, exclusive of Alaska, Hawaii, and Porto Rico.

(xxi.) *Mining Products.*—The value of the mineral production for 1912 was taken from the report of the Geological Survey. The value of pig-iron and other derived products was eliminated, being already included with manufactures. It was assumed that the whole of the coal produced in 1912 and one-tenth of the other mineral products were on hand at 31st December, 1912, the balance of the other mineral products being accounted for in the hands of the manufacturers, etc.

(xxii.) *Clothing and articles of personal adornment.*—The value taken for articles of a perishable nature, such as clothing, furnishings, dress goods, cosmetics, perfumes, etc., was that of such articles manufactured and imported during 1912. The value taken for articles of a more or less permanent value, such as jewellery of all kinds

watches, etc., was obtained by adding the value of the articles of this class manufactured and imported from 1902 to 1912 inclusive to the value of such articles as were held in 1902, less one-half for loss and destruction.

(xxiii.) *Furniture, carriages and kindred property.*—For articles in this group which were considered as perishable, such as kitchen utensils, fancy goods, trunks, valises, etc., only the product of 1912 was used. For those articles which might reasonably be expected to retain a considerable portion of their original value, such as household furniture, automobiles, musical instruments, carriages, sewing machines, etc., the value of the products for the years 1904 to 1912 inclusive, and the net imports for the same period, were added to 20% of the value of the products of this class on hand in 1904. A deduction was made on account of loss and depreciation, while to account for stock in trade already included under other heads a deduction of 50% of the total manufactures and imports for 1912 was made.

(xxiv.) *Aggregate for* 1912.—The total estimated for the year 1912 was \$187,739,071,090 (=£38,577,000,000 at \$4.86⅔ to the £). The sterling values of detailed items for 1912 will be found in section 10 hereunder, in conjunction with corresponding values for 1900 and 1904.

10. **Details for 1900, 1904 and 1912.**—For convenience of comparison the detailed figures for 1900, 1904, and 1912 are given in the attached table, the values being expressed in millions of £'s sterling. The conversion was made on the basis of \$4.86⅔ to the £.

Estimates of National Wealth, U.S.A., 1900, 1904, 1912.

Form of Wealth.	1900.	1904.	1912.
	£1,000,000	£1,000,000	£1,000,000
Real property taxed	9,519	11,405	20,212
Real property exempt	1,277	1,404	2,533
Live stock (town and country)	679	837	1,282
Farm implements and machinery	154	174	281
Gold and silver coin and bullion	345	411	538
Manufacturing machinery, tools, etc.	522	678	1,252
Railroads and their equipment	1,857	2,311	3,318
Street railways	324	456	944
Telegraph systems	43	47	46
Telephone systems	82	120	222
Pullman and private cars	20	25	25
Shipping and canals	111	174	306
Irrigation enterprises	—	—	74
Privately-owned waterworks	55	57	60
Privately-owned central electric light and power stations	83	116	431
Agricultural products	299	390	1,076
Manufacturing products	1,250	1,522	3,019
Imported merchandise	87	102	170
Mining products	67	84	167
Clothing and personal ornaments	411	514	882
Furniture, carriages, etc.	1,003	1,181	1,739
Total National Wealth	18,188	22,008	38,577
Population	75,994,575	82,466,551	95,410,503
National wealth per head of population	£239	£267	£404

PART VII.—MISCELLANEOUS ESTIMATES OF WEALTH.

CHAPTER I.—ESTIMATES OF THE NATIONAL WEALTH OF THE UNITED KINGDOM.

1. **General.**—In the case of the United Kingdom there has, up to the present, been no official estimate of the wealth of the Kingdom as a whole or of any of its component parts. Numerous estimates of varying degrees of reliability have, however, been made by various investigators, the bases of such estimates being also very varied. Much of the material given hereunder concerning the early estimates of wealth has been obtained from Giffen's "Growth of Capital," published in 1889.

2. **Sir William Petty's estimate (about 1679).**—One of the earliest of these estimates was that made by Sir William Petty, the founder of the so-called "Political Arithmetic." In this estimate, as originally prepared, an item was included for a capital valuation of the income from personal services, but in Giffen's review the amount is omitted as not being on all fours with the other items in the estimate, and not being comparable with subsequent estimates based upon Income Tax Returns. With the exclusion of the item mentioned, Petty's estimate was as follows :—

Petty's Estimate of the Capital of the People of England (about 1679).

Land.	Houses.	Shipping.	Stock of Cattle, etc.	Coined Gold and Silver.	Wares, Merchandise, Plate and Furniture.	Total.
£	£	£	£	£	£	£
144,000,000	30,000,000	3,000,000	36,000,000	6,000,000	31,000,000	250,000,000

Giffen estimates that the population of England at the time when Petty wrote, was about 5,500,000. On this basis the capital of the country would average about £46 per head.

3. **Gregory King's estimate (1688).**—The next estimate of importance is that which was prepared by Mr. Gregory King in respect of the year 1688. These figures were discussed very fully by Sir William Davenant, and were adopted by him with the express acknowledgment that they were due to Mr. Gregory King. An estimate of the capitalised value of personal service was made in this case as in that of Petty,

but it has been omitted from the table given below, since it is, in essence, an estimate of the value of the human beings constituting the population, not an estimate of their realised wealth. With this omission King's estimate is as follows :—

Gregory King's Estimate of the Wealth of the People of England (1688).

Rent at 18 Years' Purchase.	Money, Plate, Jewels and Household Goods.	Shipping, Forts, Stores, Goods, Instruments & Materials.	Live Stock, Cattle, Beasts, Fowls, etc.	Total.
£ 234,000,000	£ 28,000,000	£ 33,000,000	£ 25,000,000	£ 320,000,000

Giffen estimates the population at this date at about 5,500,000, thus giving an average wealth of £58 per head.

In reference to the foregoing estimates of Petty and King, it may be noted that Petty deduced his values of houses by capitalising house rents at 12 years' "purchase," while he used 18 years' "purchase" in the case of land values. In King's estimate 18 years' "purchase" was used in both instances.

Giffen states that a review of the estimates of Petty and King, and of the data on which they were based, leads to the conclusion that though some increase must have taken place between the two dates (1679 and 1688), it was probably not as great as the estimates suggest, and that on the whole King's figures appear to be the more reliable of the two estimates.

4. **Estimate based on Decker's figures (1740)**—In an essay by Sir Matthew Decker on the "Causes of the decline of foreign trade," particulars are given in respect of the income of the people of England, on the basis of which Giffen, applying the methods of Petty and King, deduces an aggregate of £480,000,000 as an estimate of the wealth of the people of England in 1740. For a population of about 7,000,000, this gives an average of about £69 per head.

5. **Beeke's estimate of wealth of Great Britain (1800)**.—In a work entitled "Observations on the produce of the income-tax, etc.," the Rev. H. Beeke furnished in 1800 an estimate of the capital of Great Britain. It will be noted that the estimates previously quoted relate to England alone.

The major portion of this estimate is based upon a capitalisation of the income from various sources. In the following table are given Beeke's figures as modified by Giffen, deductions having been made by him concerning an item of £300,000,000 included by Beeke in respect of the national debt, as well as an item of £250,000,000 "for the capitalisation of the income of the nation applied to Government expenditure and debt interest." Giffen states that he also made various corrections in the table after carefully perusing the text. The result is as follows :—

Giffen's Summary of Beeke's Estimate of Capital (1800).

Particulars.	Estimate of Capital.	Particulars.	Estimate of Capital.
Capitalisation of Income from—	£1,000,000	Capitalisation of Income from—	£1,000,000
Lands	720	Waste Lands	30
Tithes	75	Household Furniture ..	160
Houses	200	Plate, Jewels, etc.	50
Mines, Canals, Timber, Tolls, etc.	100	Specie	40
Farming Capital	125	Public Property—	
Home Trade	120	Shipping, Arsenals, etc.	15
Foreign Trade and Shipping	80	Provincial and Municipal Buildings, etc.	25
		Total	1,740

For a population of say 11,000,000, this works out at an average of about £158 per head.

Giffen suggests that furniture, plate, etc., and specie, which together aggregate £250,000,000, appear to have been valued too highly when compared with houses for which the value of £200,000,000 is given. In all other respects he considers Beeke's estimates as moderate, and says that he can see no reason why they should not be made use of as good contemporary estimates, and that Beeke's work is all extremely good.

6. **Colquhoun's estimate (1812) and others based thereon.**—Estimates for the United Kingdom relative to the early part of the nineteenth century were made for the years 1812, 1822 and 1833, on the basis of figures compiled by a Mr. Colquhoun, who appears to have been an officer of the Board of Trade. Colquhoun's estimate for the value of property in the *United Kingdom* in 1812 was £2,736,000,000, giving, with a population of about 17,000,000, an average of about £161 per head. Giffen, after reviewing Colquhoun's data and calculations, expresses the opinion that the estimate is a fairly good one.

An estimate for the United Kingdom, based on Colquhoun's, was made by Mr. Joseph Lowe in respect of the year 1822. This estimate totalled £2,200,000,000, or, including items of unproductive private property, such as furniture, plate, etc., which were included by Colquhoun, but omitted by Lowe, an aggregate of say £2,500,000,000. On a population of about 21,000,000, this gives an average of about £119 per head. It is believed that the decline between the 1812 and the 1822 estimates was due in large measure to the *inflation of prices* existing in 1812, which was three years prior to the termination of the Napoleonic wars.

Another estimate for the United Kingdom, based on Colquhoun's, was given in respect of the year 1833 by M. Pablo de Pebrer. This estimate totalled £3,690,000,000, or £148 per head on the basis of a population of 25,000,000. Giffen indicates certain defects in the estimate, but thinks that it " may, perhaps, pass as a contemporary valuation for the period between 1830 and 1840." He also points out that the first returns for the renewed income tax for 1843 exhibit such an increase as on the whole to confirm M. Pablo de Pebrer for 1833.

7. **Giffen's estimates for 1865 and 1875.**—In a paper read before the Royal Statistical Society[1] in 1878, Sir Robert Giffen furnished estimates of the wealth of the United Kingdom for the years 1865 and 1875. In referring in the course of his paper to the determination of existing capital, Giffen says: "The most convenient basis for such a proceeding appears now to be the income tax assessments. The method is to discriminate as far as possible in these returns the different sources of income, capitalise these at a suitable number of years' purchase, and then make an allowance or conjecture for the capital of the income not liable to income tax, or which otherwise escapes assessment, and for capital which is not treated in the income tax returns as income yielding."

As the method employed is one of some importance, it has been deemed advisable to give in full Giffen's table exhibiting his data, and the calculations employed in computing the estimated capital value.

Giffen's Estimate for the United Kingdom, 1875.

Particulars.	Income.	Years' Purchase.	Capital.
Under Schedule A—	£1,000		£1,000
Lands	66,911	30	2,007,330
Houses	94,638	15	1,419,570
Other Profits	883	30	26,490
Schedule B—			
(Farmers' Profits)	66,752	10	667,520
Schedule C—			
(Public Funds, less Home Funds)	20,767	25	519,175
Under Schedule D—			
Quarries	916	4	3,664
Mines	14,108	4	56,432
Ironworks	7,261	4	29,044
Gasworks	2,630	20	52,600
Waterworks	1,869	20	37,380
Canals, etc.	1,007	20	20,140
Fishings	207	20	4,140
Market Tolls, etc.	842	20	16,840
Other Public Companies	25,647	15	384,705
Foreign and Colonial Securities, etc.	6,836	15	102,540
Railways in United Kingdom	26,215	25	655,375
Railways out of United Kingdom	1,330	20	26,600
Interest Paid out of Rates, etc.	2,647	25	66,175
Other Profits	1,120	20	22,400
Trades and Professions—one-fifth of Total Income of 175 millions	35,000	15	525,000
Total under Income Tax	377,586	..	6,643,120
Trades and Professions omitted	7,000	15	105,000
Income of Non-income Paying Classes derived from Capital	60,000	5	300,000
Foreign Investments not in Schedules C & D	40,000	10	400,000
Movable Property not yielding Income, *e.g.*, Furniture, Works of Art, etc.	..	..	700,000
Government and Local Property, say	..	..	400,000
Total	484,586	..	8,548,120

1. Journal of the Royal Statistical Society, Vol. XLI., p. 1.

The income assessed for taxation which was not brought to account for capitalisation in this estimate comprised (i.) four-fifths of income from trades and professions (under Schedule D), £140,000,000, (ii.) the permanent charge on the national debt for 1875-6, viz., £21,737,000, and (iii.) Schedule E, made up of salaries, pensions and annuities not earned by capital, totalling £32,540,000. These three items of income totalled £194,277,000.

The total wealth shewn above, viz., £8,548,120,000, represents about £259 per head of the population of some 33,000,000.

It may be noted that this method of estimating is, in essence, a variant of the inventory method, the values of the various assets being in the main based upon a capitalisation of the income which they realise.

In the same paper Giffen makes an estimate for the United Kingdom on similar lines for 1865, and obtains a total of £6,114,063,000, or £204 per head of the then population of 30,000,000.

8. **Giffen's estimate for 1885.**—In his work on "The Growth of Capital,"[1] Giffen gives an estimate for the United Kingdom for 1885, based upon data and calculations of the same nature as those indicated in the preceding section as having been used for the 1865 and 1875 estimates. The total obtained for 1885 was £10,037,436,000, or £279 per head of the then population of 36,000,000. In the preparation of the 1885 estimate some minor alterations were made in the number of years' purchase adopted for the capitalisation of incomes. In some cases the number was increased, and in others diminished, the aggregate for 1885 being affected less than a half of one per cent. by the change.

9. **Giffen's Estimate for 1903.**—A further estimate was made by Sir Robert Giffen for a paper contributed by him to the Economics and Statistics Section of the British Association in September, 1903.[2] This estimate, however, which was not the main object of the paper, was not prepared with the same analysis of detail as characterised his estimates for 1865, 1875, and 1885, and cannot be regarded as more than a very rough approximation made to furnish a convenient working basis for the consideration of modes of expenditure. In addition to an estimate for the United Kingdom the paper contains similar estimates in respect of Canada, Australasia, India, South Africa, and the remainder of the Empire.

The figure so given for the wealth of the United Kingdom is £15,000,000,000, or £355 per head of the population, which in 1903 was about 42,250,000. The figures given in the paper for the British Empire are as follows :—

Giffen's Estimate of the Wealth of the British Empire, 1903.

United Kingdom.	Canada.	Australasia	India.	South Africa.	Remainder of Empire.	Total British Empire.
£1,000,000	£1,000,000	£1,000,000	£1,000,000	£1,000,000	£1,000,000	£1,000,000
15,000	1,350	1,100	3,000	600	1,200	22,250

1. "The Growth of Capital," by Robert Giffen. George Bell & Sons, London, 1889.
2. Journal of the Royal Statistical Society, Vol. LXVI., p. 582.

These figures have been somewhat extensively quoted, *e.g.*, by Augustus D. Webb, F.S.S., in "The New Dictionary of Statistics" for 1911, and by the Bureau of the Census, Washington, but it is clear from the context of the paper in which they appear that they were not put forward by the author as representing in most cases anything more than what may be termed "well-informed guesses."

10. **Harris and Lake's estimate, 1903-6.**—In a paper read before the Royal Statistical Society[1] on 18th December, 1906, Messrs. Harris and Lake discussed the compilation of wealth estimates on the basis of probate returns (see Part V. hereof). As the result of the calculations so made supplemented by estimates in respect of property not subject to death duties, the total wealth of the United Kingdom at or about the end of 1904 was estimated at £9,207,000,000, thus falling short of Giffen's rough estimate, quoted in Section 9, by nearly £6,000,000,000. In view of the analysis of the limitations of the probate method given in Part V. hereof, there is little doubt that the estimate of Messrs. Harris and Lake is very much in defect.

11. **Mallet's estimate, 1905 and 1906.**—In a paper read before the Royal Statistical Society,[2] on 18th February, 1908, Mr. (now Sir) Bernard Mallet further discussed the question of estimates based on probate returns, and in the course of his paper gave an estimate for England and Wales of £5,500,000,000, on the basis of the 1905 returns, and £6,098,000,000, on the basis of the 1906 returns, irrespective of any allowance on account of property not subject to death duties. For the reasons already referred to, it is probable that these estimates are much below the truth (see Part V. hereof).

12. **Chiozza Money's estimate, 1908.**—In an estimate based largely on the method of capitalising incomes, Mr. L. G. Chiozza Money[3] gave as a total for the wealth of the United Kingdom in 1908 a sum of £13,762,000,000, or £313 per head on a population of some 44,000,000.

CHAPTER II.—ESTIMATES OF WEALTH IN FRANCE.

1. **Various early estimates.**—On p. 127 of his work, already mentioned ("The Growth of Capital"), Giffen quotes M. de Foville as having furnished in his "La France Economique" particulars of several estimates of the value of property in France, and gives the following summary of some of the more important of these :—

Estimate of the Value of Property in France.

Authors.	Date.	Real Property.	Personal Property.	Total.
		£1,000,000	£1,000,000	£1,000,000
M. de Girardin	1853	3,680	1,320	5,000
M. Wolowski	1871	4,800	2,200	7,000
M. C. Duc d'Ayen	1872	4,000	3,800	7,800
M. C. D. Vacher	1878	8,640	1,760	10,400
M. Amelin	1878	5,400	4,200	9,600
M. S. Mony	1881	4,600	4,040	8,640

1. Journal of the Royal Statistical Society, Vol. LXIX., p. 709.
2. Journal of the Royal Statistical Society, Vol. LXXI., p. 65.
3. "Riches and Poverty," by L. G. Chiozza Money. Tenth edition, p. 62.

These estimates were based on such different methods that they are not strictly comparable with each other or with estimates for other countries.

2. **M. de Foville's estimate, 1886.**—An estimate for 1886 by M. de Foville himself is thus shewn by Giffen :—

M. de Foville's Estimate of the Value of French Property, 1886.

Real Property exclusive of Houses.	Houses, etc.	French Funds and Foreign Securities.	Other Movable Property.	Total.
£1,000,000	£100,000,000	£1,000,000	£1,000,000	£1,000,000
3,200	1,600	1,200	2,000	8,000

This estimate includes the French national debt. In Giffen's estimates the national debt of England was always excluded.

3. **Edmond Thery's estimate, 1908.**—In Dr. Karl Helfferich's "Germany's economic progress and national wealth," M. Edmond Théry is quoted as having furnished for France for 1908 an estimate of wealth amounting to about £11,400,000,000.

CHAPTER III.—ESTIMATES OF WEALTH IN GERMANY.

1. **Bucher's estimate, 1908.**—In "The New Dictionary of Statistics" for 1911, Augustus D. Webb quotes Bücher as giving an estimate of the wealth of Germany for 1908 totalling about £16,000,000,000.

2. **Helfferich's estimate, 1910-11.**—In his "Germany's economic progress and national wealth," Dr. Karl Helfferich gives for the year 1910-11 an estimate of the wealth of Germany as lying between £14,000,000,000 and £15,600,000,000.

3. **Estimate of wealth in Prussia, 1911.**—Returns shewing the wealth of Prussia were published in the "Statistisches Jahrbuch für den Preussischen Staat" for 1913, issued in 1914. The assessment presumably applies to the year 1911. The total population was about 40,739,600 in 1914 ; or about 40,165,219 at the end of the year 1911. Taking the "mark" as of the value one shilling, the result was £5,195,926,400 for all persons possessing wealth of the value £300 (viz., 1,767,034), and not excepted by special provisions of the law : or including the latter (2,009,170 persons), the result was £5,353,291,550. There are, however, over 38 million persons not accounted for. In obtaining the totals, the methods of ascertaining the amounts (followed by the Prussian authorities) were as follows :—

In all cases where the wealth was less than £50,000 (1,000,000 marks), the total was obtained by multiplying the number of cases by the middle value of the range; in all cases where the individual wealth was greater than £50,000 the true totals were given.

	Number.	Amount.
Possessing wealth, £300-£50,000	1,757,685	£3,920,727,900
Possessing wealth above £50,000	9,349	1,275,198,500
Persons assessed but not taxed	242,136	157,365,150
Not accounted for (to make up total population)	38,156,049	*£381,560,490
Total	40,165,219	£5,734,852,040

* Estimated only. In a county in Australia there appeared to be about £15.40 per head for all persons possessed of under £300, the ranges £300-500, £500-£750, £750-£1,000 being .50, .32, and .18 of the total £300-£1,000, while the Prussian returns gave .46, .28, and .26. The number in Australia possessed of under £300, including children, etc., was 20.7 times the number possessed of £300-£1,000, while in Prussia it was 63.3 times that number. It is inferred that the average can hardly be more than £10 per head.

This represents £142 15s. 8d. per head of population.

PART VIII.—CONCLUSIONS.

CHAPTER I.—LIMITATIONS AND USES OF WEALTH ESTIMATES.

1. **Limitations**—It cannot be too strongly emphasised that by whatsoever means an estimate of the wealth of a community is compiled, the resultant figures can never be regarded as more than rough approximations. Normally the wealth of *an individual* at any given moment may, from certain points of view, be said to be represented by the market value of the property of various kinds of which he is then in possession, the tacit assumption made being that a market exists for each class of property. Although such a basis of valuation might be said to be inapplicable to the wealth of the whole community, because of the impossibility of treating it as all subject to sale at the same moment, it may nevertheless be supposed that the individual items of wealth might be sold under conditions conforming to the general state of the community. In this case the aggregate of the values can be taken to be the aggregate wealth expressed in terms of money.

Apart from this assumption of a hypothetic possibility of sale, it is often not practicable to determine a reliable value for certain of the private possessions, even though these contribute largely to the well-being of the community. In most of such cases the cost would be too high to take for the purposes of a valuation, while the price likely to be realised at a forced sale would usually represent far less than the value of the possessions to the owner in the absence of such a sale. These and similar limitations apply to all valuations available for the purpose of wealth-estimates, whether such valuations are made in respect of probate returns, for war census purposes, or for the purposes of an inventory estimate. A review of the conclusions relative to these several methods of estimation is given in succeeding chapters.

In addition to the limitations which result from valuation difficulties, there are others that arise, in the case of comparative returns, from differences in the methods and minutiæ of estimation adopted at the several dates in respect of the estimates constituting the subject of comparison. Thus, the comparison of an estimate based on probate returns for a given period with an inventory estimate for a date not included in that period might suggest an increase or decrease in the wealth of the community, though this might be largely fictitious, owing to failure to take into account the characteristic peculiarities of the several estimates. For this reason, it is essential that an estimate for which any degree of reliability is claimed should be accompanied by an explicit account of the method adopted, and, where practicable, a detailed review of the contributing items. Without this the significance of the estimate for comparative purposes is not sufficiently definite.

Another limitation to such estimates is that due to the personal equation of the observer. This is, of course, true of all observations, but is especially in evidence in the present case, where the judgments of different observers enter so largely into the question. For example, in a determination of the values of real estate in the Commonwealth by the inventory method, an aggregation is made for Australia of the values allocated to different properties by the municipal valuers of some 1070 different local governing bodies. Similar considerations apply to individual estimates in the case of a wealth census or of a return for probate purposes, and are also applicable to the exercise of judgment on the part of the statistician responsible for the estimate.

2. **Uses.**—In his work "The growth of capital," previously quoted, Giffen indicates numerous uses to which estimates of wealth may be put, of which the following is a summary :—

(i.) To measure the accumulation of capital in communities at intervals of some length (not less perhaps than ten years).

(ii.) To compare the income of a community, where estimates of income exist, with its property.

(iii.) To measure the burden of national debts upon different communities.

(iv.) To measure, in conjunction with other factors such as aggregate income, revenue and population, the relative strength and resources of different communities.

(v.) To indicate generally the proportions of the different descriptions of property in a country to the total—how the wealth of a community is composed.

(vi.) To measure the progress of a community from period to period, or the relative progress of two or more communities, in conjunction with facts as to progress in income, revenue, population, etc.

(vii.) To compare the aggregate accumulation in a community with that portion of the accumulation which can be described as free savings, which latter is gradually invested through the agency of the Stock Exchange.

(viii.) To throw light on the question of changes in the value of money (which changes are themselves among the facts to be investigated and allowed for in comparing the valuations of different countries or the valuations of the same country at different times).

To the uses above specified may be added the following, which are available in respect of a wealth and income census, and to some extent in respect of an estimate based on probate returns :—

(ix.) To determine the distribution of wealth amongst the individual members of the community, and thus to furnish a measure of the relative degree of opulence or penury of the various classes and the number of persons in each of such classes.

(x.) To enable a comparison of wealth with income to be made in respect of the various classes.

It is clear that in order to be applicable to the purposes indicated above, the estimate, however made, must represent a fairly close approximation to the actual facts, but in view of what has already been said in sec. 1 of the present Chapter, it is evident that close accuracy is unattainable, and in some respects may even be said not to be susceptible of exact definition.

CHAPTER II.—CENSUS OF WEALTH AND INCOME.

1. **General.**—From the nature of the case, it might be assumed that the most complete and accurate record of the wealth of the community would be obtained by asking the information of the individual owners themselves, in other words, by taking a wealth census, and in some respects this assumption is often warranted. It is however, subject to various limitations and conditions, which will be considered in the succeeding sections.

2. **War Census of 1915.**—As previously stated, a census of wealth was taken in 1915 in connection with the census of males of military age, but owing to its emergency character, and the fact that the returns were not distributed or collected as in the case of a census of population, there were serious defects in the numbers of persons furnishing returns, and less serious though probably important shortages in the total amount as compiled from the returns. The total amount recorded was approximately £1,643,000,000, but from the nature of the case there are evidently no means of determining even approximately the amount of wealth omitted by default in the supply of returns. The machinery of the War Census Act threw upon the members of the community the responsibility for the supply of the information, the requisite forms, envelopes, etc., being made available at all post offices. With such a method, and in the absence of a record of the people liable to make returns, it is clear that the detection of default except in certain accidental cases becomes almost an impossibility.

3. **Advantages and disadvantages of census method.**—A marked feature of the wealth census method of obtaining the desired information is the fact that particulars can be obtained by it of the number and amount of estates of any given size, and further, that by including provision for a record of income on the census form, valuable information concerning the relation of wealth to income under various circumstances can be satisfactorily obtained with a minimum of labour.

A further advantage of the method is the fact that the information being furnished in each case by the owner, the labour of valuation is widely distributed, and is made by the person who, in the majority of cases, is most intimately in touch with the requisite data. Associated with this advantage, however, is the disadvantage that in certain cases the fear of subsequent taxation conduces to undervaluation.

The principal disadvantage of the method is the cost which such a census necessarily entails owing to the large volume of detailed particulars which is presented for tabulation and compilation. Another disadvantage is the necessity which exists for the observation of the strictest secrecy in respect of the returns furnished. The extreme sensitiveness of many members of the community in this respect is such as probably to render inapplicable the method of collection adopted at an ordinary population census. Special machinery for the collection of the data would thus be necessitated, thereby increasing the expense and delaying the publication of the results.

4. **Suggestions for future action.**—In view of the fact that the wealth and income census gives important results in respect of the community which are not obtainable by any other method of estimation, it appears desirable that such a census should be taken *every ten years in conjunction with the ordinary population census* now provided for under the "Census and Statistics Act 1905." By such means the cost referred to above would be considerably reduced, as the wealth and income census forms could be distributed by the census collectors, and if no objection were offered by the person making the return, the collector could also collect the form with the ordinary population returns. In those cases in which there is an objection to disclosing the particulars in respect of wealth and income to a local resident (the collector) even though under an oath of secrecy, arrangements could be made for the collector to furnish an envelope for the transmission of the form post free to the Commonwealth Statistician, and could, by a note to this effect in his record book, ensure that the person to whom the envelope was issued would not be overlooked in the event of default.

CHAPTER III.—SUCCESSION METHOD OF ESTIMATING PRIVATE WEALTH.

1. **Succession methods.**—Estimates of private wealth based upon any form of the succession method really depend upon a correct determination of the proportion of the aggregate of wealth which passes in a unit of time (1 year). The limitations of the method have already been indicated in Part V., see in particular sec. 39., p. 131, where conclusions regarding the probate method are set out. In any attempt to accurately ascertain the proportion of all wealth which passes in a year, it has to be remembered that the proportion in question depends upon the sex and for successions proper (*i.e.*, by death, as in probate cases), upon the death-rates according to sex. Obviously, also, it depends upon the amount passing by "settlements" (*i.e.*, by gifts at marriage, or otherwise). Estimates of aggregate wealth are in defect whenever wealth passes without record, and the circumstances of settlement must be accurately known as regards the ages both of the donors and donees, for only in this way can the proportion passing in a unit of time be known. A little consideration will shew that so far as marriage settlements are concerned the rate of "passing" is appreciably greater than the passing of wealth by the death of its possessor.

To ascertain the proportion of wealth passing by death, it is strictly necessary to know the death-rate according to the wealth possessed, if the average death-rate vary with the wealth possessed. Hence, inquiry into this question is essential if high precision be aimed at.

Estimates of wealth for probate are likely to be always in defect, consequently their correction should be attempted. The factor of correction may, however, itself change with time; that has to be ascertained.

At the present time there is no adequate statistic which could form a perfectly satisfactory basis for succession estimates, but there is no reason why in any civically disciplined community such statistic should not be available.

2. **Statistical requirements for an accurate succession method.**—The statistical requirements for the accurate ascertainment of the *rate of succession*, *i.e.*, the proportion of wealth passing in a unit of time (1 year, say)—is therefore :—

(i.) Record of deaths according to age, sex, wealth possessed.

(ii.) Record of the numbers living in the same categories.

(iii.) Record of the ages of donors of wealth, and of the donees also, together with the amounts donated :

(*a*) in the case of settlements at marriage, and

(*b*) in the case of other settlements.

(iv.) Variations in numbers of deaths, marriages, etc.

It has to be borne in mind that all attempts to ascertain the ratio of the living to the dying, for any sex, age, and class, from mortality tables, is liable to considerable error, and also that in limited populations the experience of a single year will not give sufficiently large numbers to furnish representative or average results. The succession method then must always be deemed one of inferior accuracy.

The essential limitation of the succession methods is that it must necessarily be assumed that the proportion of the aggregate of private wealth passing in a unit of time will be constant if the death-rate and general conditions of the community are

constant. This assumption is doubtless *on the whole* valid, but reveals the intrinsic nature of the estimate, viz., that it is one which does not apply to any given *moment* of time, but gives —presumably—a result which is an average over the period from which the data are drawn.

In regard to the absolute value of the estimate, it may be also noted that, inasmuch as the ratio of the living to the dying is a large one, and varies from age to age, the errors or any peculiarities in the data are correspondingly magnified in the result.

CHAPTER IV.—THE INVENTORY METHOD OF ESTIMATION.

1. **General.**—Of all *estimates of wealth*, the method which involves the smallest expenditure of public funds is that usually known as the inventory method. This apparent saving, however, is not due to paucity of data, but to the fact that the estimates so made are based very largely on statistical data which have been obtained for other purposes, and which require relatively little work to reduce them to the form requisite for the purposes of the valuation. In ultimate analysis the sources of information are both numerous and varied, as is evident from a review of the details given in Part VI., Chapter I. hereof.

2. **Advantages and disadvantages of the inventory method.**—As just mentioned, one of the advantages of the method is cheapness, owing to utilisation of existing data. This feature leads to the further advantage that the estimates may be made at much shorter intervals than in the case when relatively expensive methods are employed.

A further advantage is that, from the nature of the method the data are available in groups according to the nature of the wealth, but this is accompanied by the disadvantage that the method does not furnish means for the classification of wealth according to the size of the estates involved, and does not furnish any facilities for a detailed comparison of assets and income. The limitations of this method arising from the difficulty of assigning an appropriate value to certain classes of possessions are common to all valuations. For example, in the case of such items as furniture, clothing, household and personal effects, etc., it is probable that an estimate based on a consideration of the population and the number of dwellings of different sizes and rentals is at least as sound as the estimates under such heads furnished at a wealth census or in probate returns.

3. **Suggestions for future action.**—Owing to the small cost involved, it appears desirable that an estimate of wealth on the inventory basis should be made every five years, or with shorter intervals. The more frequent estimates would naturally lead to improvement in the basis adopted under the various heads, and would thus tend to increase the reliability of the estimates. Owing to its essential limitations, however, it appears desirable that an inventory estimate made say, quinquennially, should be supplemented by a decennial census of wealth. By such means extensive information of a valuable character would be available in respect of the material progress of the community. It would also be advisable in the preparation of subsequent estimates of this character to supplement the particulars concerning private wealth by obtaining estimates in respect of such national and communal wealth as is capable of valuation.

APPENDIX.

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